MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The REVIEW for January, 1896, is based on reports from 2,737 stations occupied by regular and voluntary observers, classified as follows: 149 from Weather Bureau stations; 35 from U. S. Army post surgeons; 2,395 from voluntary observers; 32 from Canadian stations; 96 received through the Southern Pacific Railway Company; 30 from U. S. Life-Saving stations; international simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by Mr. A. J. Henry, Chief of the Division of Records and Meteorological Data. Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada, and of Dr. Mariano Bárcena, Director of the Central Meteorological Observatory of Mexico.

CLIMATOLOGY OF THE MONTH.

GENERAL CHARACTERISTICS.

During the current month the average pressure showed a notable deficit on the coasts of Oregon and Washington. The average temperature was generally above the normal. Precipitation was below the normal, except on the Pacific coast.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart IV. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were high in the Middle and South Atlantic States, and also in the Dakotas and Saskatchewan. The highest were: Prince Albert and Bismarck, 30.25; Salt Lake City, 30.24; Winnipeg, 30.23; Battleford, St. Vincent, Moorhead, Idaho Falls, Cincinnati, Northfield, Washington, Harrisburg, Parkersburg, Lynchburg, Raleigh, Charleston, Atlanta, Knoxville, and Chattanooga, 30.22.

The *mean pressures* were low in Washington and Newfoundland. The lowest were: Tatoosh Island, 29.81; Esquimault, 29.84; St. Johns, N. F., 29.85; Astoria, 29.88.

As compared with the normal for January the mean pressure was in excess in New England, Quebec, and Ontario, but deficient in Washington and Oregon. The greatest excesses were: Father Point and Northfield, 0.15; Quebec, 0.13; Rockliffe, Montreal, Halifax, and Albany, 0.12; Eastport and Sault Ste. Marie, 0.11; Boston, Kingston, and Harrisburg, 0.10.

The greatest deficits were: Tatoosh Island, 0.21; Roseburg, 0.19; Baker City and Portland, Oreg., 0.15; Walla Walla, 0.14; Port Angeles, 0.13; Eureka, 0.12.

As compared with the preceding month of December the pressures reduced to sea level show a decided rise in the interior valley of the continent, but a fall on the Pacific Coast. The greatest rises were: Battleford, Prince Albert, and Swift Current, 0.35; Minnedosa and Winnipeg, 0.34; Edmonton, 0.33; Qu'Appelle and St. Vincent, 0.31. The greatest falls were: Eureka, 0.24; Roseburg, 0.21; Red Bluff, 0.20; Winnemucca and Sacramento, 0.17; San Francisco and Portland, Oreg., 0.16; Astoria, Carson City, and Fresno, 0.15.

AREAS OF HIGH AND LOW PRESSURE.

By Prof. H. A. HAZEN.

During January there have been eleven areas of high pressure and ten of low pressure, mapped on Charts I and II. One of the high areas, No. IV, was central in the middle Plateau Region for 5 days, but had no motion, and hence does not enter the calculations in the table, as also low area VIII, which was noted for only twenty-four hours. The accompanying table gives some of the general points regarding these highs and lows, and the following is a brief description of these conditions:

HIGH AREAS.

I.—First noted in the west Gulf a. m. of 1st. Its motion was eastward, reaching and disappearing in the Atlantic a. m. of 3d.

II.—First noted to the north of Montana a. m. of 1st. It rapidly developed in forty-eight hours, a pressure of 31.20 being reported from Calgary a. m. of 3d. Its motion was along the northern border, reaching the mouth of the St. Lawrence p. m. of 10th. The severest cold wave of the month accompanied this high, and a special cold wave bulletin, No. 1, was issued. A fall in temperature of 46° in twenty-four hours occurred at Havre p. m. of 1st, and at Bismarck p. m. of 2d.

III.—On the p. m. of 3d high area II extended in a long ridge of high pressure from Manitoba to the west Gulf, and III was first noted as a separate high in the south of this ridge. Its motion was south, and disappeared in the central Gulf p. m. of 6th.

IV.—This was an intensification of the rather permanent high area in the Plateau Region, and had no motion.

V.—First noted p. m. of 10th on the north Pacific Coast. This was the only high that originated so far west. Its motion was southeast, and it was last noted in the central Mississippi Valley, p. m. of 12th.

VI.—First noted to the north of Montana a. m. of 13th. Its motion was east at first, then southeast, and finally northeast, disappearing in the Gulf of St. Lawrence p. m. of 20th.

VII.—First noted to the north of Montana p. m. of 16th. Its motion was generally southeast, and it disappeared in the Ohio Valley p. m. of 19th.

VIII.—First noted in Manitoba a. m. of 20th. Its motion was along the northern border of the country, and it disappeared over Newfoundland a. m. of 26th.

IX.—First noted a. m. of 21st to the north of Montana. Its motion was beyond the region of observation, and was last noted in Manitoba a. m. of 24th.

X.—First noted p. m. of 23d to the north of Montana. Its motion was southeast and east, and it disappeared off the middle Atlantic coast a. m. of 30th.

XI.—First noted to the north of Montana a. m. of 28th. Its motion was eastward, and it was last noted in Maine p. m. of 31st.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	29	88	3, a. m.	28	82	800	2.0	399	16.6
II	1, a. m.	50	115	10, p. m.	50	68	3,280	9.5	345	14.4
III	3, p. m.	39	97	6, a. m.	31	84	1,380	2.5	552	23.0
IV*										
V	10, p. m.	49	124	12, p. m.	39	91	1,860	2.0	930	38.8
VI	13, a. m.	52	113	20, p. m.	50	64	3,280	7.5	440	18.3
VII	16, p. m.	52	115	19, p. m.	39	86	2,180	3.0	726	30.2
VIII	20, a. m.	53	103	26, a. m.	52	65	2,740	6.0	456	19.0
IX	21, a. m.	53	116	24, a. m.	54	100	980	3.0	327	13.6
X	23, p. m.	55	118	30, a. m.	36	79	2,980	6.5	458	19.1
XI	28, a. m.	52	119	31, p. m.	48	69	2,400	3.5	684	28.5
Sums							21,880	45.5	5,317	
Mean of 10 paths									532	22.2
Mean of 45.5 days									481	20.0
Low areas.										
I	1, a. m.	50	100	3, p. m.	46	57	2,050	2.5	818	34.1
II	4, a. m.	48	128	10, a. m.	27	79	3,680	6.0	613	25.5
III	6, p. m.	53	118	10, a. m.	41	71	2,420	3.5	692	28.8
IV	8, p. m.	53	116	14, p. m.	46	58	3,500	5.5	636	26.5
V	14, p. m.	42	126	20, p. m.	49	81	2,770	6.0	462	19.3
VI	15, a. m.	27	96	18, a. m.	38	71	1,650	3.0	550	22.9
VII	17, a. m.	42	107	19, p. m.	36	73	2,010	2.5	804	33.5
VIII	19, p. m.	50	128	20, p. m.	51	111	†	†	†	†
IX	30, p. m.	31	99	25, p. m.	48	77	1,540	5.0	308	12.8
X	24, p. m.	44	126	28, p. m.	48	90	2,210	4.0	552	23.0
Sums							21,830	38.0	5,435	
Mean of 9 paths									604	25.7
Mean of 38 days									574	23.9

*Stationary in middle Plateau for 5 days. †Too short path.

LOW AREAS.

I.—First noted a. m. of 1st in Manitoba. Its motion was eastward along the north border of United States, and disappeared over Newfoundland p. m. of 3d.

II.—First noted off the north Pacific Coast a. m. of 4th. Its motion was east and southeast, and it disappeared off the Florida coast a. m. of 10th.

III.—First noted to the north of Montana p. m. of 6th. Its motion was eastward, and it disappeared off the Massachusetts coast a. m. of 10th.

IV.—First noted to the north of Montana p. m. of 8th. Its motion was eastward, and it disappeared over Newfoundland p. m. of 14th.

V.—For twenty-four hours on 14th a disturbance had been noted off the north Pacific Coast, but its definite progress upon the land began p. m. of 14th. Its motion was very slow for several days, and then more rapid to the eastward. It was last noted to the north of Lake Erie p. m. of 20th.

VI.—This storm began in the west Gulf a. m. of 15th. Its motion eastward brought it to the Florida coast p. m. of 16th; thence it moved along the Atlantic Coast, and it disappeared off the middle Atlantic Coast a. m. of 18th.

VII.—First noted in Colorado a. m. of 17th. Its motion was rapid toward the east, and it was last noted off the middle Atlantic Coast p. m. of 19th.

VIII.—First noted off the north Pacific Coast p. m. of 19th. It had a slight eastward motion for twenty-four hours, but rapidly filled up to the north of Montana.

IX.—First noted p. m. of 20th in south Texas. Its motion was northeast, and was last noted in the St. Lawrence Valley p. m. of 25th. More general rain or snow accompanied this storm than any other of the month.

X.—First noted p. m. of 24th off the north Pacific Coast. Its motion was eastward, and it was last noted over Lake Superior p. m. of 28th.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution* of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the high irregular surface of the Rocky Mountain Plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean* temperatures were: Key West, 66.4; Jupiter, 62.3; Yuma, 57.8; Tampa, 57.2; Corpus Christi, 56.7. The lowest mean temperatures were, in the United States: St. Vincent, —20; and in Canada: Prince Albert, —11.0; Battleford, —9.3; Edmonton and Winnipeg, —4.5; Minnedosa, —4.0; Qu'Appelle, —2.9.

As *compared with the normal* for January, the mean temperatures for the current month were above the normal in all regions except the Atlantic Coast States where they were below.

The greatest excesses were: North Platte, 13.2; Dodge City, 12.8; Huron, 11.8; Concordia, 11.1; Denver, 10.7; Idaho Falls and Pierre, 10.5; Omaha, 10.1. The greatest deficits were; Edmonton, 5.7; Jupiter, 4.7; Vineyard Haven, 4.6; Key West, 4.0.

Considered by districts the mean temperatures for the current month show departures from the normal as given in Table I. The greatest positive departure was: Middle Slope, 9.8. The greatest negative departures: Florida Peninsula, 3.5; South Atlantic, 2.5.

The years of highest and lowest mean temperatures for January, are shown in Table I of the REVIEW for January, 1894. The mean temperature for the current month was the highest on record at: Concordia, 32.5; Topeka, 32.4; Wichita, 35.7;

Santa Fe, 33.9; Pueblo, 36.8; Cheyenne, 32.2; Idaho Falls, 26.0; Salt Lake City, 34.0; Los Angeles, 51.6; Fresno, 50.6; Point Reyes Light, 51.2; Sacramento, 50.2; Carson City, 40.4; Winnemucca, 35.6; Idaho Falls, 26.0; Baker City, 30.3; Roseburg, 44.4; Eureka, 50.0; Port Angeles, 39.0. It was not the lowest on record at any regular station of the Weather Bureau.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 87, Los Angeles (9th); 81, Yuma (21st); 80, San Antonio (21st), Jupiter (23d); 79, Key West (23d), Corpus Christi (21st), Phœnix (10th), and San Luis Obispo (10th). Lowest maxima: 34, Sault Ste. Marie (31st); 36, Alpena (12th), Marquette (31st); 38, St. Vincent (21st); 39, Northfield, (3d). The highest minima were; 55, Key West (5th); 42, Point Reyes Light (24th); 40, Jupiter (1st), San Francisco (6th); 39, San Diego 12th). The lowest minima were: —39, St. Vincent (4th); 31, Havre (3d); —27, Moorhead (4th); —25, Duluth (4th), Sault Ste. Marie (5th), Miles City (3d).

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Neah Bay, 65; Baker City, 51; Idaho Falls, 39; Pierre, 60; Huron, 51; Sioux City, 63; Salt Lake City, 54; Carson City, 60; Los Angeles, 87; Yuma, 81. The minimum temperatures were the lowest on record at: Narrangansett Pier, —11; Block Island, —4.

The greatest daily range of temperature and the extreme monthly ranges are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values of the greatest daily ranges were: Helena, 55; Rapid City, 54; Pueblo, 53; Havre, 52. The smallest values were: Key West, 12; Point Reyes Light, 15; Port Huron, Grand Haven, and Astoria, 17; Buffalo, Detroit, Hatteras, Galveston, and Fort Canby, 18; San Francisco, 19; Spokane, Nantucket, Philadelphia, Marquette, and Cleveland, 20. Among the extreme monthly ranges the largest values were: Havre, 84; St. Vincent, Rapid City, and North Platte, 77; Miles City, 76; Sioux City, 73; Huron, 72; Pierre, 71. The smallest values were: Point Reyes Light, 19; San Francisco, 23; Key West, 24; Fort Canby, 26; San Diego, 23; Astoria, 29.

Accumulated monthly departure from normal temperatures.—For the period January 1 to 31, the average temperature was above the normal throughout the whole country, except in New England, middle Atlantic, Florida Peninsula, and east Gulf. In regions where the temperature was deficient, the average deficit for the period was as follows: New England, 2.0; middle Atlantic, 1.6; south Atlantic, 2.5; Florida Peninsula, 3.5; east Gulf, 1.6.

In regions where the temperature was in excess, the average excess for the period was as follows: west Gulf, 2.5; Ohio Valley and Tennessee, 2.3; lower Lake, 0.5; upper Lake, 4.2; North Dakota, 4.7; upper Mississippi, 6.4; Missouri Valley, .4; northern Slope, 7; middle Slope, 9.3; southern Slope (Abilene), 4.9; southern Plateau, 4.6; middle Plateau, 8.1; northern Plateau, 9.4; north Pacific, 3.1; middle Pacific, 3.4; southern Pacific, 4.1.

The limit of freezing weather is shown on Chart VI by the isotherm of minimum 32°, and the limit of frost by the isotherm of minimum 40°.

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity* of water evaporated from a similar surface during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this quantity the *average humidity of the air* during any given interval of time may be deduced.

Measurements of evaporation within the thermometer shelters are difficult to make so as to be comparable at temperatures above and below freezing, and may be replaced by computations based on the wet-bulb temperatures. The absolute amount of evaporation from natural surfaces not protected from wind, rain, sunshine, and radiation, are being made at a few experimental stations and will be discussed in special contributions.

Sensible temperatures.—The sensation of temperature experienced by the human body and ordinarily attributed to the condition of the atmosphere depends not merely on the temperature of the air, but also on its dryness, on the velocity of the wind, and on the suddenness of atmospheric changes, all combined with the physiological condition of the observer. A complete expression for the relation between atmospheric conditions and nervous sensations has not yet been obtained.

PRECIPITATION.

[In inches.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month was heaviest on the immediate coasts of northern California, Oregon, and Washington. It was least in southern California, Nevada, and New Mexico. The largest values were: East Clallam, 26.9; Neahbay, 25.8; Tatoosh Island, 22.6; Pysht, 21.4.

The *current departures* from the normal precipitation are given in Table I, which shows that there was a deficit in most regions. The principal excesses were in the Pacific Coast States. Large excesses were: Neahbay, 10.5; Tatoosh Island, 9.3; Sacramento, 5.9; Carson City, 3.3; Palestine, 3.3; Shreveport and San Francisco, 3.2. The large deficits were: Knoxville, 4.3; Chattanooga, 4.2; Nashville, 4.0.

The *average departure* for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normals exceed 100):

Above the normal: Florida Peninsula, 107; west Gulf, 113; North Dakota, 192; southern Slope, 153; southern Plateau, 144; middle Plateau, 164; north Pacific, 136; middle Pacific, 143; southern Pacific, 119.

Below the normal: New England, 41; middle Atlantic, 45; south Atlantic, 75; east Gulf, 67; Ohio Valley and Tennessee, 42; lower Lake, 71; upper Lake, 76; upper Mississippi, 55; Missouri Valley, 57; northern Slope, 85; middle Slope, 48; northern Plateau, 91.

The years of greatest and least precipitation for January are given in Table I of the REVIEW for January, 1890. The precipitation for the current month was the greatest on record at: Williston, 2.02; Tatoosh Island, 22.57; Neahbay, 25.85; Carson City, 5.26; Sacramento, 9.76; El Paso, 1.63. It was the least on record at: Eastport, 0.84; Northfield, 0.87; Albany, 0.98; Block Island, 2.02; Narragansett Pier, 1.59; Harrisburg, 1.00; Port Huron, 0.69; Green Bay, 0.98; Louisville, 0.82; Lexington, 1.25; Knoxville, 1.49; Parkersburg, 1.42.

The *total accumulated monthly departures* from normal precipitation since the beginning of the current year, furnishes

the following excesses: Florida Peninsula, 0.20; west Gulf, 0.50; North Dakota, 0.60; southern Slope (Abilene), 0.50; southern Plateau, 0.20; middle Plateau, 1.00; north Pacific, 3.50; middle Pacific, 2.50; southern Pacific, 0.40. The deficits are as follows: New England, 2.40; middle Atlantic, 1.90; south Atlantic, 1.10; east Gulf, 1.70; Ohio Valley and Tennessee, 2.60; lower Lake, 0.80; upper Lake, 0.50; upper Mississippi, 0.80; Missouri Valley, 0.50; northern Slope, 0.10; middle Slope, 0.50; northern Plateau, 0.20.

Details as to *excessive precipitation* are given in Tables XII and XIII.

The hourly distribution of precipitation is not now tabulated.

The *total monthly snowfall* at each station is given in Table II. Its geographical distribution is shown on Chart No. VI. The limit of freezing temperatures and possible snow is shown on the same chart by the isotherm of minimum 32°. The southern limit of frost in exposed localities is approximately shown by the isotherm of minimum 40°, within the thermometer shelter.

The depth of snow on the ground at the close of the month is shown on Chart VII.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 21, 22, 23. Arizona, 28, 29. Arkansas, 13. California, 17, 19, 20, 28, 29, 30. Florida, 22. Georgia, 21, 23. Louisiana, 21, 22, 25. Nevada, 21, 28. New Mexico, 29. North Carolina, 13. South Carolina, 23, 24. Tennessee, 23. Texas, 25, 30. Utah, 21.

SLEET.

The following are the dates on which sleet fell in the respective States:

Arkansas, 15, 23, 25. Colorado, 16, 22. Connecticut, 12, 24. Delaware, 31. Georgia, 7, 16, 23. Idaho, 1, 8, 15, 16, 17, 20 to 23, 29. Illinois, 10, 11, 16, 19, 21 to 24. Indiana, 19, 22, 23, 24. Iowa, 15, 17, 18, 19, 22, 23, 30, 31. Kansas, 14, 15, 16, 18, 30, 31. Kentucky, 10, 11, 16, 27. Louisiana, 6, 21. Maine, 3, 24, 25. Maryland, 9, 10, 19, 22, 23, 24. Massachusetts, 12, 22 to 25. Michigan, 9, 18, 22 to 25, 31. Minnesota, 6, 9, 10, 11, 15, 17, 19, 21, 23, 27 to 31. Mississippi, 15, 24, 25. Missouri, 15, 19, 20, 22 to 25. Montana, 10, 21. Nebraska, 14 to 19, 21, 22, 24, 29, 30, 31. Nevada, 13, 17, 21, 23, 25, 28. New Hampshire, 24, 25. New Jersey, 3, 7, 9, 24. New Mexico, 1, 26, 27. New York, 3, 18, 19, 23 to 26, 29, 30, 31. North Carolina, 7, 15, 16. North Dakota, 9, 11, 21, 30. Ohio, 3, 9, 14, 18, 19, 22, 23, 24. Oregon, 1, 16, 17, 18, 23. Pennsylvania, 3, 19, 22 to 26, 31. South Carolina, 15, 16. South Dakota, 15, 16, 21 to 24, 28 to 31. Tennessee, 7, 13, 23, 24. Texas, 28, 29, 30. Utah, 29. Virginia, 7, 8, 23. Washington, 1, 4, 8, 13 to 18, 23, 24, 25, 27. West Virginia, 3, 4, 5, 9, 21, 22, 23. Wisconsin, 10, 18, 20, 22, 23, 24.

WIND.

The *prevailing winds* for January, 1896, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart IV, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

The *diurnal variation* in the velocity of the wind is shown in Table VII, which gives the total movement for each hour of seventy-fifth meridian time, as deduced from self-registering anemometers at about 136 stations.

HIGH WINDS.

Maximum wind velocities of 50 miles or more per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Block Island, R. I	10	54	ne.	Fort Canby, Wash	26	72	s.
Do	24	66	e.	Do	27	55	sw.
Cheyenne, Wyo	1	56	w.	Do	31	66	se
Denver, Colo	1	66	sw.	Landen, Wyo	1	50	w.
Do	2	54	nw.	Moorhead, Minn	21	53	se.
Eastport, Me	25	50	ne.	Tatoosh Island, Wash	5	53	s.
Fort Canby, Wash	5	72	s.	Do	6	54	se.
Do	6	60	se.	Do	7	60	se.
Do	7	70	s.	Do	16	59	e.
Do	8	61	s.	Do	17	52	e.
Do	16	59	se.	Do	25	52	s.
Do	19	60	s.	Do	26	50	s.
Do	20	66	s.	Winnemucca, Nev	18	52	sw.
Do	24	54	e.	Do	21	54	sw.
Do	25	73	s.	Woods Hole, Mass	4	53	nw.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 16 regular stations of the Weather Bureau by its photographic, and at 21 by its thermal effects. At one station records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time; for convenience the results are all given in Table XI for each hour of local mean time.

Photographic and thermometric registers give the duration of that intensity of sunshine which suffices to make a record, and, therefore, they generally fail to record for a short time after sunrise and before sunset, because, even in a cloudless sky, the solar rays are then too feeble to affect the self-registers. If, therefore, such records are to be used for determining the amount of cloudiness, they must be supplemented by special observations of the sky near the sun at these times. The duration of clear sky thus specially determined constitutes the so-called twilight correction (more properly a low-sun correction), and when this has been applied, as has been done in preparing Table XI, there results a complete record of clear sky from sunrise to sunset in the neighborhood of the sun. The twilight correction is not needed when the self-registers are used for ascertaining the duration of a special intensity of sunshine, but is necessary when the duration of cloudiness is alone desired, as is usually the case.

The cloudiness is determined by numerous personal observations at all stations during the daytime, and is given in the column of "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table XI.

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *duration* of effective sunshine whence the duration relative to that of possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. These numbers have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentages of duration of sunshine is almost always larger than the observers' personal estimate of percentages of area of clear

sky; the average excess for January, 1896, is 4.4 per cent for photographic records, and 4.5 per cent for thermometric records. The details are shown in the following table in which the stations are arranged according to the greatest possible duration of sunshine, and not according to the *observed* duration as heretofore.

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Possible duration.	Instrumental.	Personal.	Difference.	Thermometric stations.	Possible duration.	Instrumental.	Personal.	Difference.
	H'rs.	%	%	%		*H'rs.*	%	%	%
Galveston, Tex	326.8	45	44	1	New Orleans, La	324.6	42	41	1
Savannah, Ga	320.5	51	39	12	Vicksburg, Miss	320.5	34	32	2
San Diego, Cal	318.3	62	56	6	Atlanta, Ga	316.2	48	44	4
Santa Fe, N. Mex	311.8	77	63	14	Wilmington, N. C	316.2	53	52	1
Dodge City, Kans	306.5	55	47	8	Little Rock, Ark	314.7	40	35	5
Kansas City, Mo	303.7	34	37	— 3	Louisville, Ky	306.5	31	24	7
Washington, D. C	303.8	46	46	0	San Francisco, Cal	306.5	37	35	2
Eureka, Cal	298.4	25	36	— 4	Baltimore, Md	303.8	40	37	3
Salt Lake City, Utah	298.4	40	25	15	Cincinnati, Ohio	303.8	34	34	0
Cleveland, Ohio	295.5	20	23	— 3	St. Louis, Mo	303.8	48	41	7
Eastport, Me	286.3	54	43	11	Columbus, Ohio	301.1	25	20	5
Portland, Oreg. *	283.1	22	31	— 9	Philadelphia, Pa	301.1	57	45	12
Bismarck, N. Dak	279.8	30	35	— 5	New York, N. Y	298.3	48	45	3
Helena, Mont	279.8	41	44	— 3	Boston, Mass	295.5	52	48	4
Phœnix, Ariz	318.3	77	72	5	Chicago, Ill	295.5	35	30	5
Denver, Colo	301.1	80	57	23	Des Moines, Iowa	295.5	49	38	11
					Detroit, Mich	295.5	34	27	7
					Buffalo, N. Y	292.7	21	13	8
					Rochester, N. Y	292.7	49	26	23
					Portland, Me	289.7	62	45	17
					Portland, Oreg. *	283.1	26	31	— 5

* Records kept by both methods.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table X, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

The dates on which reports of thunderstorms for the whole country were most numerous were: 21st, 33; 22d, 35d; 23d, 45; 31st, 27.

Thunderstorm reports were most numerous in Texas, 44; Florida, 33; California, 30; Louisiana, 28; Alabama, 19; Georgia, 16; Mississippi, 15.

Thunderstorms were most frequent in: Texas, 11 days; California, 8; Louisiana, 7; Florida and Mississippi, 5.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 1st to the 4th, and also the 25th to the 31st, inclusive. On the remaining twenty days of this month 102 reports were received, or an average of about 5 per day. The dates on which the number of reports especially exceeded this average were: 3d, 71; 4th, 23; 5th, 21.

Auroras were reported by a large percentage of observers in: Maine, 126; New Hampshire, 77; North Dakota, 55; Minnesota, 27; Wisconsin, 26; New York, 20.

Auroras were reported most frequently in: North Dakota, 11 days; Montana, 10; Minnesota and Wisconsin, 9; Maine, New Hampshire, and New York, 8.

CANADIAN REPORTS.

No thunderstorms were reported.

Auroras were reported as follows: 2d, Charlottetown, Winnipeg; 3d, Quebec, Montreal, Rockliffe, Toronto, White River, Minnedosa, Prince Albert; 4th, Rockliffe, Toronto, White River, Port Arthur, Winnipeg, Prince Albert; 5th, St. Andrews, Toronto, White River; 6th, Father Point, Quebec, Minnedosa; 8th, Minnedosa, Medicine Hat; 9th, Montreal; 10th, Medicine Hat; 11th, Battleford; 13th, Minnedosa; 14th, Father Point, Minnedosa, Medicine Hat, Prince Albert; 15th, Father Point, Port Arthur; 16th, Port Arthur, Minnedosa, Edmonton; 17th, St. Andrews, Minnedosa; 18th, Father Point, Minnedosa, Battleford; 19th, Quebec, Minnedosa, Edmonton; 20th, Minnedosa; 21st, Father Point, Medicine Hat; 26th, Prince Albert; 29th, Medicine Hat; 31st, Yarmouth.

INLAND NAVIGATION.

The *extreme and average stages of water* in the rivers during the current month are given in Table VIII, from which it appears that the only river that rose above the danger line was the Sacramento, at Red Bluff, on the 29th.

ICE IN RIVERS AND HARBORS.

The charts of depth of snow on the ground and thickness of ice published weekly by the Weather Bureau show that by Monday, January 6, much ice had formed on the Great Lakes, the upper Mississippi and Missouri rivers; there was a general increase in thickness throughout the month and on Monday, January 27, the thickness in inches was about as follows:

Missouri River.—Miles City, 16; Williston, 25.5; Bismarck, 30; Pierre, 19; Yankton, 18.5; Sioux City, 15; Omaha, 10; Kansas City, 2.0.

Red River of the North.—Moorhead, 30.

Upper Mississippi.—St. Paul, 17; La Crosse, 15; Dubuque, 10.5; Davenport, 9; Keokuk and Hannibal, 0.

Hudson River.—Albany, 11.

Lake Superior.—Duluth, 21.5; Sault Ste. Marie, 7.

Lake Michigan.—Green Bay, 13; Milwaukee, 6; Chicago and Grand Haven, 0.

Lake Huron.—Alpena, 9.5; Port Huron, 6.0.

St. Clair River.—Detroit, 12.

Lake Erie.—Toledo, 4; Sandusky, 4; Cleveland, 4; Erie, 7.5; Buffalo, 4.

Lake Ontario.—Oswego and Rochester, 4.

METEOROLOGY AND MAGNETISM.

By Prof. FRANK H. BIGELOW.

It has been found expedient to make a further modification in the presentation of the meteorological and magnetic data, showing the approximate synchronisms in the two types of elements, beginning with January, 1896. This is in part due to the action of the vertical-force magnetometers at Washington and Toronto, which are both affected by magnetic waves from the neighboring trolley-line systems, and also, in part, to the improved operation of the new "magnet-watch," used as an integrator of work in the varying terrestrial magnetic field. The encroachment of trolleys into the neighborhood of our permanent magnetic observatories causes great injury in this branch of science. There seems to be no way to compensate this action without shutting off too much of the terrestrial field by excessive d mping, and in that case the variations are greatly obscured. Fortunately the horizontal components, from the bifilar and the declinometer, are much less disturbed, inasmuch as the magnetic lines induced by the trolleys enter the earth along the normal, or very nearly so. The synchronism of the horizontal components at Washington and Toronto continues to be valuable; but in the vertical component the amplitudes derived from the data show very different sensitiveness, and the sequence of crests is also very irregular at times. This misfortune, falling upon our observatories, is to be deplored, but it can not be avoided, unless by removal of the instruments to locations far from all electric lines. In San Antonio, Tex., the same difficulty was encountered 3 miles from the trolley line, and it was found that such disturbances could be detected for a distance of 20 miles. Accordingly our computation has been modified by omitting ΔV, dz, s, and α, all of which depend upon the vertical force.

THE NEW MAGNET-WATCH INTEGRATOR.

During the past two years some experiments have been in progress, looking to the perfecting of an apparatus which shall be simple to operate, inexpensive, and at the same time able to record the *relative variations* in the external terrestrial magnetic field with considerable accuracy. It is now believed that we have such an instrument, and that the fundamental principle upon which it is constructed is capable of important developments. The Weather Bureau could adopt only that type of apparatus for general use at its stations which admitted of observations as simple as those of a barometer or thermometer. The expense of installing and operating first-class magnetic observatories makes it quite impracticable to consider a plan embracing more than three magnetic stations. It will always be necessary, even with successful secondary apparatus, to have some primary observatories for the measurement of absolute values, and for control upon the values from the adopted secondary instruments. A proper arrangement would be three first-class magnetic stations, one in the East, one in the Mississippi Valley and one on the northern Rocky Mountain Plateau, together with a magnet-watch integrator at each of the telegraphing stations of the service from which daily reports could be forwarded. In this way the local conditions of the field could be studied. At present, with one instrument at Washington only, it is impossible to do more than to indicate the fact that there is an important system of forces to be considered, which apparently have much to do with the building up of weather conditions, especially in the northwest. A record of the magnet-watch for January, 1896, is introduced in place of the data excluded on account of the imperfections of the vertical force observations. My attention was first called to the possibility of developing a new principle for the measurement of the variations in the intensity of the terrestrial magnetic field by Mr. F. H. Hesse, Salt Lake City, Utah. He related that by accident his watch became heavily magnetized, and that its rate then varied from day to day through such wide ranges, that it attracted his attention and excited his interest to observe it carefully. A comparision was made by him with a well regulated chronometer. The daily losses or gains in seconds were tabulated and plotted as ordinates on a base whose unit of length was twenty-four hours. The resulting curve, or broken line, was found to have sufficient similarity with the mean curve that I published in the MONTHLY WEATHER REVIEW for the normal intensity curve of the solar field, presented to the earth with each synodic revolution of the sun on its axis, to induce him to send the record to the Weather Bureau, with the request that the subject be fully investigated.

It seemed to me at the time that the germ principle was correct, and might possibly be utilized, if a suitable apparatus could be procured. Evidently such a mechanism can be regarded as a true integrator of work done in a varying magnetic field, the energy expended being derived from two sources; first, the elastic or molecular energy of the watch spring, going out as a constant total every twenty-four hours, or nearly so, corresponding to the perfection of the watch itself; second, the vibrating impulse of the magnetic field on the magnet, which would in the course of twenty-four hours amount to a certain number of seconds, depending upon the strength of the field. If the mechanism is good, then the variation in the number of seconds, marked off by the watch, can be taken as a measure of the mean intensity of the field itself for the elapsed interval of time. By comparing the variations in the watch rate with the variations in the field as given by the magnetometers, the value of one second in dynes can be found. This value is not a vector quantity, as it lacks the directional element, but for the purposes in view by the Weather Bureau that is not needed.

Our efforts to perfect the apparatus can be briefly narrated. A watch was procured, magnetized by contact with a steel magnet, and its record was found promising, but not satisfactory. The form of the ordinary balance wheel, being such as to bring the two poles back nearly to the center, is extremely bad. The two metals comprising the rim, with the compensation weights, leaves little metal for the magnetism; also the steel is too soft to retain permanent magnetism. Much unreliability is therefore inherent in the common watch, and the performance was necessarily disappointing.

For the period of about a year, Mr. James P. Hall, of Brooklyn, N. Y., cooperated with me in a series of observations on two similar watches, with the view of ascertaining whether synchronisms of rate variation would be found in New York City and Washington, D. C. We had a similar partial success, but not enough to feel that the indications were reliable measures of the variations of the magnetic field.

Finally, I stated the case to Prof. Dr. Th. Edelmann, Munich, and he constructed the modified watch-magnet, whose record it is proposed to publish as evidence that we have in hand a fruitful type of germ apparatus for magnetic variations, when the relative values for a given interval, and not the absolute values at certain epochs are required. The balance wheel was removed from a Charmilles, Geneva watch; the spindle to the escapement was lengthened to about 18 millimeters, with suitable support in the standard; for the balance a hollow cylindrical magnet of the same moment of inertia as the original wheel was substituted, length, 20 mm., diameter, 3 mm., thickness of steel, about $\frac{1}{2}$ mm. There is no temperature compensation; the case is nonmagnetic, also all the material except the chain and springs. When running, the watch is laid on a shelf which is midway between two vertical soft iron bars, $22\frac{1}{2}$ cm. long and $2\frac{1}{2}$ cm. in diameter, placed end on, 4 cm. apart, along the axis of the bars. The effect is to cause the vibrations of the magnet to pass at right angles to a field induced by the earth's field, and varying in intensity with it. The iron bars concentrate the external field and give it a constant direction at the magnet. The watch is wound twice daily, at 8 a. m. and 8 p. m. The standard time is obtained from the noonday signals of the U. S. Naval Observatory, and an accurate comparison of the watch is made. The January record is found on Chart V. The first curve gives the relative variations of the horizontal component of the earth's magnetic field, as determined at Washington and Toronto; the second, the variations in the rate of the magnet watch; the third, the variations in the pressure for the stations in North Dakota and South Dakota, and Canada, as explained in the MONTHLY WEATHER REVIEW, January 1895, page 7; the fourth, the variations of temperature in the same locality.

Making a comparison of these curves, as heretofore described, we infer that it is the synchronism in the minor crests that is apparently due to the magnetic field, the longer curvatures being more properly attributed to the convectional meteorological system. In the watch curve, the slope is approximately eliminated by the method of plotting the daily gains and losses on a zero line. The watch does, however, record long-range variations, since, by extending our inspection to the record of the subsequent February, March, and April, it is found that its hour hand has retreated to about 11h. 40m. for noon, and advanced again to 12h. 00m. This movement has occurred several times in addition to the system of minor fluctuations that appear on curve No. 2. The rate of the watch is occasionally decidedly changed in 24 hours, since about 300 seconds may be gained or lost on the normal run in a single day, and smaller values are also recorded for other days. The most promising feature of the experiment is this large measurable quantity which may ultimately be of much service in determining latent weather forces.

When all these curves are compared among themselves, the general relations of the magnetic and meteorological forces can be defined. The data of the horizontal component, shown in curve No. 1, Chart V, is that which evaluates the changes in the intensity of the resultant of the combined terrestrial and solar magnetic fields. Now, according to my conception of the fundamental phenomena, these changes are due to certain equivalent solar impressed forces, which I call polar and equatorial radiations, and which are equal to the residuals given in curve No. 1, on Chart V, but with *reversed sign*. Hence we have the law that an *increase in the intensity of the solar* magnetic output, approaching the earth from the north to the south side of the ecliptic, corresponds (1) to an *increase in the march of the watch rate*, the magnetic field being stronger; (2) to an *increase in the barometric pressure of the atmosphere*, especially in the arctic and the subtropical magnetic belts; and (3) to a *decrease in the temperature* of the same regions. That is to say, years or seasons of *increased solar output give higher arctic pressures and lower temperatures*. Extending this backward to geological periods, the Glacial epochs corresponded to increased solar action, which lowered the temperature in the arctic regions. These become, therefore, measures of the longest solar period known to us.

In current meteorological phenomena, "highs" seem to be built upon the west Canadian plains by an increase in the intensity of the sun's polar magnetic field. They are then caught up in the earth's convectional system and transported eastward in the northern or the southern circuits. The running down of these highs, under gravitation, produces a system of lows, with cyclonic movements, on their periphery, or between two adjacent highs with counterflowing currents in the lower strata of air. Similar functions may, to a much smaller extent, be attributed to the tropical highs, but the agency of the solar equatorial field obscures this operation, except, perhaps, in the case of hurricanes, considered as a phenomenon embracing many years. In order to successfully trace these functions throughout the globe, our knowledge must be much increased. Even in the northwest, where the operation of the polar field is pronounced, the intermingling of the effects of the polar and equatorial radiations causes much looseness of synchronism. The intermittent nature of the rate of the eastward drift is the chief factor in that irregularity, but even so, by paying attention to the minor curvatures, it is easily discovered that such a system of forces as described is constantly at work upon the atmospheric elements. A close detailed comparison of the temperatures and pressures of the northwest, as given on the daily weather map, extended over several years, not only confirms the accuracy of the adopted period of solar rotation, but also the view that has been explained as our working hypothesis.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts in regard to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective services.

Snowfall and rainfall are expressed in inches.

Alabama.—The most noticeable characteristics of the climatic conditions for the month were a very general and severe cold wave from the 3d to 6th, which spread over the entire State, giving freezing temperature as far south as the Gulf Coast. The mean temperature was 44.1°, or 1.2° above the normal. The highest, 78°, was recorded at Tuscaloosa on the 31st, and the lowest, 9°, at Decatur on the 4th. The average precipitation was 4.25, or 1.11 less than normal. The greatest monthly amount was 8.71, at Healing Springs, and the least, 1.77, at Daphne.

Arizona.—The mean temperature was 47.7°, or about 8° above normal. The highest, 90°, at Maricopa, and the lowest, 4°, at Flagstaff. The average precipitation was 0.55, or about 0.44 below normal. The greatest amount was 2.00,at Reymert, and the least, 0.00, at San Simon and Texas Hill.

Arkansas.—The mean temperature was 41.4°, or 3.2° above normal. The highest was 78°, at Elon on the 31st, and the lowest, 4°, at La Crosse on the 4th. The average precipitation was 4.09, or normal. The heaviest falls were reported from the central parts of the State, and the lightest were generally in the extreme northern portion. The greatest amount was 6.94 at Camden, and the least, 1.32, at Dardanelle. There were about 50 per cent more cloudy days than usual.

California.—The mean temperature was 50°, or 4.4° above normal. The highest was 112°, at Salton, in the desert region, on the 21st, and the lowest, 8° below zero, at Boca on the 22d. The average precipitation was 8.45, or 3.93 above normal. The greatest monthly amount was 45.17, at Lagunitas, 6 miles from San Rafael, Marin County, and the least, "trace," at Barstow, in the desert region of San Bernardino County.

Colorado.—The month was unusually warm over the entire State. Comparison with the normal shows that there was an average excess of about 5° daily in the western counties and the San Luis Valley, and from 7° to 10° over the mountain districts and the eastern Slope. The highest temperature was 75°, at Downing on the 5th, and near Crook, Logan County, on the 19th; the lowest, 24° below zero, at Gunnison on the 5th. The average precipitation was 0.81, or 0.12 below normal. The greatest monthly amount was 7.69, at Ruby, Gunnison County, and the least, "trace," at Byers, Arapahoe County.

Florida.—The mean temperature was 56.5°, or 4.5° below normal. The highest was 93°, at Tampa on the 30th, and the lowest, 20°, at Milton on the 5th. The average precipitation was 3.96, or 0.55 above normal. The greatest monthly amount was 8.01, at New Smyrna, and the least, 0.45, at Lemon City. Several severe cold waves passed over the State; the most severe one reached the State on the night of the 4th, and its influence was felt on the 7th as far south as Jupiter.

Georgia.—The mean temperature was 44.4°, or about 1.0° above normal. The highest was 75°, at Poulan on the 30th, and the lowest, 5°, at Diamond on the 4th. The average precipitation was 4.11, or about 0.75 less than the normal. The greatest monthly amount was 6.47, at Whitesburg, and the least, 2.77, at Ramsey. The month was generally mild and pleasant.

Idaho.—The mean temperature was 27.6°. The highest temperature was 62°, at Lewiston on the 27th, and the lowest, 25° below zero, at Junction on the 13th. The first half of the month the usual January weather as regards temperature prevailed, but with the 15th came a succession of chinook* winds which raised the temperature above normal and gave everything a spring-like appearance; in many places plowing was begun. The mean daily temperature for the last two weeks was 12° higher than that of the first half. The average precipitation was 2.92; the greatest amount was 7.85, at Soldier, and the least, 0.07, at Junction. From the 14th to the 21st rainfall was general and greatly above normal. Mr. Frank Adams, observer at Salubria, says: "For several days this month this section was visited by the heaviest and most constant downpours of rain that have ever occurred within the memory of the oldest inhabitant of this valley; travel of all kinds was suspended for 48 hours. The heavy rise of water on the 20th caused the low lands to be about five feet under water, doing considerable damage, washing out six reservoirs and three bridges, and spoiling a considerable amount of hay throughout this section of the country."

*[NOTE.—The word "chinook" is now used in Idaho to designate any warm wind, including warm southwest rain winds; but such usage is contrary to meteorological authority, and will not be adopted in the MONTHLY WEATHER REVIEW. An indiscriminate use of this word has also sprung up in the Mississippi Valley. The technical usage of professional meteorology is the only one that can be allowed in the MONTHLY WEATHER REVIEW. For the present, therefore, the term "chinook" will only be applied to those winds that can be distinctly proven to be warm, dry, descending winds, and as the term "fœhn" has not yet been misapplied by American newspaper usage, that word will be preferred. We can not have an exact science of meteorology unless our words have an exact signification and are used with precision.—C. A.]

Iowa.—The mean temperature was 23.4°, or 7° above normal. The highest was 68°, at Neola on the 10th, and the lowest 20° below zero, at Cresco on the 4th. The average precipitation was 0.48, or 0.90 below normal. The greatest monthly amount, 2.10, occurred at Seymour, and the least, "trace," at Denison and Rock Rapids.

Illinois.—Excepting the very short sharp cold wave of the 3d to 5th, and the slight cold period from the 12th to 14th, principally in north and northwest counties, the month was uniformly warm, averaging 6.2° above normal. The minimum was 15° below zero, at Ashton on the morning of the 4th, and the maximum, 61°, at Cairo and Mt. Vernon on the 30th. Rainfall was largely lacking up to the 21st, when a rain period of four days gave most of the rain for the month; this, with the rainfall on the 31st, comprised the rain periods. The average fall was 1.16, or 1.09 below normal, and the lowest which has been recorded since 1878. The northern section was especially lacking in precipitation, the snowstorms being very light and few. The least precipitation reported was 0.43 at Morrisonville, and the greatest, 3.54, at Greenville, about 30 miles south of the former. The average snowfall was 1.1 inch; most of the snow, however, fell in the northern sections in two light storms. The amount of snow on the ground was very small at the beginning of the month, and on the 15th there was but a trace in the northeast country, while the month ended with bare ground, practically free from frost and very muddy.

Indiana.—The mean temperature, 29.8°, was 3.6° above normal. The highest temperature, 60°, was reported from Evansville on the 30th, and at Edwardsville on the 31st, and the lowest, 14° below zero, at Tipton on the 4th. The average precipitation, 1.26, was 1.68 below normal. The greatest monthly amount, 2.68, occurred at Hammond, and the least. 0.55, at Vincennes.

Kansas.—The mean temperature was 34.2°, or 6.3° above normal. The highest temperature was 77°, at Goodland on the 20th, and the lowest, 18° below zero, at Wallace on the 3d. The precipitation was 0.19 below the average. The greatest monthly amount, 1.45, occurred at Coldwater, and the least, 0.16, at Wallace. The month was one of the cloudiest and foggiest Januaries on record.

Kentucky.—The mean temperature was 36.1°, or 2.1° above normal. The highest was 74°, at Alpha on the 31st, and the lowest, 3° below zero, at Caddo on the 4th. The average precipitation was 1.25, or 2.73 less than normal. The greatest amount was 2.51, at Canton, and the least, 0.15, at Greensburg. The month was generally damp and gloomy on account of the large excess of cloudiness and frequent fogs.

Louisiana.—The mean temperature was 49.4°, or 1.5° below normal. The highest was 83°, at Lawrence on the 31st, and the lowest, 14°, at Oxford on the 5th. The average precipitation was 3.21, or 1.25 less than normal. The greatest monthly amount was 8.71, at Trinity, and the least, 1.16, at Melville.

Maryland.—The mean temperature was 31.9°, or normal. The highest was 66°, at Boettcherville on the 30th, and the lowest, 13° below zero, at Deer Park on the 6th. The average precipitation was 1.80, or 1.46 below normal. The greatest monthly amount was 3.33, at Burkittsville, and the least, 0.90, at Deer Park.

Michigan.—The mean temperature was 23.1°, or 2° above normal. The highest was 54°, at Three Rivers, and the lowest, 25° below zero, at Sault Ste. Marie and Boon on the 5th. The average precipitation was 1.40, or 0.96 below the normal. The greatest monthly amount was 3.97, at Sault Ste. Marie, and the least, 0.45, at Flint.

Minnesota.—The mean temperature was 12.3°; the highest was 53°, at Pleasant Mounds on the 10th, and the lowest, 48° below zero, at Leech Lake Dam on the 4th. The average precipitation was 0.76, or slightly below normal, but badly distributed. There was an excess in the northern two-thirds of the State, but the deficiency in the southern portion was so great as to reduce the average to less than normal. The greatest monthly amount was 3.35, at Lutsen, and the least, "trace," at Bingham Lake.

Mississippi.—The mean temperature was 45.5°, or about normal. The highest was 77°, at Magnolia on the 31st, and the lowest, 10°, at French Camp on the 5th, and Yazoo City on the 4th. The average precipitation was 4.20, or 1.30 below normal. The greatest montly amount was 7.92, at Fayette, and the least, 2.32, at Pearlington.

Missouri.—The mean temperature was 32.7°, or 5.6° above normal. The highest was 71°, at Willow Springs on the 9th, and the lowest, 9° below zero, at Unionville on the 3d. The average precipitation was 1.16, or 0.69 below normal. The greatest monthly amount was 3.97, at New Madrid, and the least, 0.27, at Conception. At a very few stations the precipitation was slightly in excess of normal, but, as a rule, it was deficient.

Montana.—The mean temperature was 20.0°, or about 9° above normal. The highest was 65°, at Bozeman on the 8th, and the lowest, 41° below zero, at Kipp on the 3d. Some very sudden changes in temperature occurred on the 16th and 17th; at Dillon on the 16th it rose from 6° to 40° in two hours; at Red Lodge on the same date from 21° below zero to 20° above in one hour; at Kipp, on the 17th, from 11° below zero to 21° above in 9 minutes, and at Lewistown, on same date, from 10° to 30° in three hours. The average precipitation was 0.94, or about normal. The greatest monthly amount was 4.04, at Troy, and the least, 0.05, at Manhattan. The month was remarkably mild and pleasant.

Nebraska.—The mean temperature was 28.4°, or 9.6° above normal. The highest was 78°, at Brokenbow on the 30th, and the lowest, 20° below zero, at Whitman on the 3d. The average precipitation was 0.37, or 0.31 below normal. The greatest monthly amount was 1.30, at Fort Robinson, and the least, "trace," at several stations.

Nevada.—The mean temperature was 33.9°, or 6.7° above normal. The highest was 70°, at Hamilton on the 8th, and the lowest, 26° below zero, at Stofiel on the 13th. The average precipitation was 1.80, or 0.31 above normal. The greatest monthly amount was 10.70 at Lewers Ranch, and the least. 0.06, at Silver Peak.

New England.—The mean temperature was 21.5°, or 1.8° below normal. The highest was 50°, at Vineyard Haven on the 3d, and Nantucket on the 24th, and the lowest, 27° below zero, at West Milan on the 7th. The average precipitation was 1.92, or 2.02 below normal. The greatest monthly total was 3.70, at Natick, and the least, 0.31, at Fairfield.

New Jersey.—The mean temperature was 28.6°, or 0.9° below normal. The highest was 61°, at Millville on the 24th, and the lowest, 7° below zero, at Somerville on the 6th. The average precipitation was 1.66, or 2.22 below normal. The greatest monthly total was 2.81, at Moorestown, and the least, 0.68, at Belvidere.

New Mexico.—This was the warmest January in New Mexico that has been recorded by the Service. The highest temperature was 75°, at Eddy on the 20th, and the lowest, 12° below zero, at Springer on the 1st. The precipitation was considerably below normal. The greatest monthly amount was 1.65, at Chama, and the least, 0.00, at Engle, and "trace" at Fort Union, Gallinas Springs and Los Lunas.

North Carolina.—The mean temperature was 38.7, or 1.5° below normal. The highest was 70°, at Oakridge and Marion on the 30th, and the lowest, 2° below zero, at Linville on the 4th. The average precipitation was 2.79, or 1.71 below normal. The greatest monthly amount was 4.74, at Horse Cove, and the least, 1.12, at Rockingham.

North Dakota.—The mean temperature was 29.4°, or 2.9° above normal. The highest was 58°, at Fort Yates on the 10th, and the lowest, 42°, below zero, at Gallatin on the 4th. The average precipitation was 0.70, or 0.11 above normal. The greatest monthly amount was 2.02, at Williston, and the least, 0.08, at Portal.

Ohio.—The mean temperature was 29.4°, or 2.6° above normal. The highest was 70°, at Defiance and New Waterford on the 30th, and the lowest, 14° below zero, at New Waterford on the 4th. The average precipitation was 1.67, or 1.37 below normal. The greatest monthly amount was 3.40, at Dupont, and the least, 0.20, at Annapolis.

Oklahoma.—The mean temperature was 40.3°, or 9.2° above normal. The highest was 79°, at Mangum on the 9th, and the lowest 2° below zero, at Purcell on the 4th. The average precipitation was 1.04, or 0.86 below the Fort Sill normal. The greatest monthly amount was 2.54, at Kemp, and the least, 0.25, at Eufaula.

Oregon.—The mean temperature was 40.2°, or 4.2° above normal. The highest was 70°, at Langlois on the 6th, and the lowest, 6° below zero, at Beulah on the 12th. The average precipitation was 8.76, or 2.30 above normal. The greatest monthly amount was 27.12, at Glenora, and the least, 1.05, at Lone Rock.

Pennsylvania.—The mean temperature was 27.6°, or 3.4° above normal. The highest was 60°, at Chambersburg and Shinglehouse on the 30th, and the lowest, 15° below zero, at Shinglehouse on the 6th. The average precipitation was 1.43, or 2.13 below normal. The greatest monthly amount was 2.40, at Shinglehouse, and the least, 0.52, at South Eaton.

South Carolina.—The mean temperature was 43.8°, or 2.6° below normal. The highest was 72°, at Spartanburg on the 18th, Gillisonville and Little Mountain on the 30th, and Trial on the 31st. The lowest was 9°, at St. Georges on the 5th. The average precipitation was 3.02, or 1.38 below the normal. The greatest monthly amount was 4.54, at Longshore, and the least, 1.51, at Cheraw.

South Dakota.—The mean temperature was 18.6°, or 7.6° above normal. The highest was 79°, at Fort Meade on the 21st, and the lowest, 28° below zero, at Ashcroft on the 2d. The average precipitation was 0.34, or 0.17 below normal. The greatest monthly amount was 1.10, at Oelrichs, and the least, "trace," at Highmore, Nowlin, Parkston, and Vermilion. The month as a whole was unusually mild.

Tennessee.—The mean temperature was 39.2°, or more than 2° above normal. The highest was 71° at St. Joseph on the 30th and Elizabeth on the 31st; the lowest, 5°, at Bristol and Sewanee on the 3d and Rugby on the 4th. The average precipitation was 2.28, or 2.56 below normal. The greatest monthly amount was 5.85, at Tullahoma, and the least, 0.46, at Elizabeth.

Texas.—The temperature, on an average for the State, was 3.5° above normal. The highest was 92°, at Twohig on the 22d, and the lowest, 1°, at Coldwater on the 3d. The precipitation averaged 0.27 above normal. It was in excess in all sections except along the coast. The greatest monthly amount was 15.40, at Marshall, and the least, "trace," at Sierra Blanca.

Utah.—The mean temperature was 28.4°, or much above normal; the last half of the month there was an excess of about 15°. The highest was 66°, at St. George on the 21st, and the lowest, 17° below zero, at Fort Duchesne on the 1st. The average precipitation was 0.81 below normal. The greatest amount was 2.45, at Huntsville, and the least, 0.05, at Loa. The average depth of snowfall was 3 inches.

Virginia.—The mean temperature was 35.3°, or 1.6° below normal. The highest was 68°, at Birdsnest on the 24th, and the lowest, 4° below zero, at Monterey on the 4th. The average precipitation was 2.20, or 2.18 below normal. The greatest monthly amount was 3.54, at Charlottesville, and the least, 0.75, at Saltville.

Washington.—The mean temperature was 36.5°, or 2.2° above normal. The highest was 74°, at Kennewick on the 10th, and the lowest, 6° below zero, at Hunters. The average precipitation was 7.80, or 2.25 above normal. The greatest monthly amount was 26.93, at East Clallam, and the least, 0.35, at Kennewick. The greatest excess occurred in the western part of the State; in the eastern section the excess was very slight.

West Virginia.—The mean temperature was 32.3°, or about normal. The highest was 62°, at Bluefield on the 18th, and the lowest, 5° below zero, at Nuttallburg on the 5th. The average precipitation was 1.59, or decidedly below normal. The greatest monthly amount was 2.72, at Weston, and the least, 0.67, at Hewlett.

Wisconsin.—The mean temperature was 18.6°, or 4.8° above normal. The highest was 53°, at Meadow Valley on the 29th, and the lowest, 38° below zero, at Butternut, on the 5th. The average precipitation was 0.97, or 0.68 less than normal. The greatest amount was 2.40, at Howard, and the least, 0.40, at Spooner.

Wyoming.—The mean temperature was 27°, or about 5° above normal. The highest was 70°, at Embar on the 9th, and the lowest, 25° below zero, at Sheridan on the 3d. The average precipitation was 0.79, or only slightly above normal. The greatest monthly amount was 2.21, at Yellowstone, and the least, 0.24, at Lander.

SPECIAL CONTRIBUTIONS.

CLOUD OBSERVATIONS AND AN IMPROVED NEPHOSCOPE.

By C. F. MARVIN, Professor of Meteorology, U. S. Weather Bureau (dated April 15, 1896).

Observations and studies of clouds, their forms, heights, velocities and directions of motion, constitute at present perhaps the most important source of information as to what is going on in the upper atmosphere. Much attention has been concentrated upon the faithful and regular observation of temperature, rainfall, winds, etc., within a few feet of the surface of the earth, but here the influences of local surroundings are always a more or less important factor, whereas the character and behavior of clouds result from the operations of great forces on large masses of the atmosphere, unmodified by important disturbing causes. If thoroughly studied, classified and understood, the cloud phenomena should greatly aid meteorologists in explaining much that is now obscure or unknown concerning the changes of storm and sunshine, wind and calm that constantly succeed one another. Accurate observations of surface conditions have a real importance and value in themselves, and have thus far absorbed practically all the attention, whereas the observation of clouds has generally been accorded a place of secondary importance, and has been conducted in a more or less imperfect manner; in fact, the best class of cloud observations has been made by only a few special students. This subject has been extensively discussed at the several meetings of the International Congress of Meteorologists, and as early as 1891 the matter was placed in the hands of a permanent committee. One result of their labors is shortly to go into effect, namely, an agreement entered into by nearly all the meteorological services of the world to observe and study clouds systematically and according to a uniform scheme at a few selected stations for a period of one year, beginning May 1, 1896.* The observations to be conducted by the Weather Bureau will be made in the most complete and comprehensive manner at Washington, and somewhat less elaborately at other selected stations.

Elements in cloud observations.—The following list sets forth the several elements that may be considered in cloud observations:

(1) Kind or name of cloud.

(2) Direction of the cloud from the observer; that is, its azimuth.

(3) The angular elevation of the cloud above the horizon; that is, its angular altitude.

(4) The direction of its motion measured on a horizontal plane; that is, the azimuth of its motion.

(5) The apparent velocity of its motion.

(6) The height of the cloud; that is, the vertical distance of the cloud above the surface of the earth.

Cloud forms.—Clouds take on an infinite variety of forms and structures, but these, nevertheless, may be grouped into some ten or fifteen classes or typical varieties. A systematic classification of this sort has been presented by the International Cloud Committee that is quite generally acceptable to meteorologists, although any such classifications must always be regarded as purely arbitrary and conventional. The general adoption everywhere of one such classification is highly desirable, as it provides a uniform and convenient system of names for clouds of the different kinds, however objectionable any one classification may be in itself. The cloud committee will publish soon a cloud atlas containing plates representing typical cloud forms obtained by selection from large numbers of cloud photographs.

The following table, which gives the mean heights and velocities of the different cloud forms, will be of interest. The data contained therein is the result of a large number of measurements made at the Blue Hill Meteorological Observatory, Massachusetts:

Mean heights and velocities of clouds grouped into five levels.

[Annals of the Astronomical Observatory of Harvard College, Vol. XXX, Part III Observations made at Blue Hill Observatory. The velocities are given in meters per second.]

	Mean height.		Mean velocity.	
	Summer half year.	Winter half year.	Summer half year.	Winter half year.
	Meters.	*Meters.*	*m.p.s.*	*m.p.s.*
Cirrus level	9,757	8,012	28.0	43.9
Cirro-cumulus level	8,228	5,039	24.1	40.9
Alto-cumulus level	4,228	3,484	11.2	20.2
Cumulus level	1,657	1,571	8.9	13.7
Stratus level	563	454	7.2	10.2

Mean heights and velocities of the different cloud forms.

Cirrus	9,923	8,051	28.5	51.0
Cirro-stratus	8,754	7,846	24.9	38.0
Cirro-cumulus	7,606	6,992	22.9	50.3
Alto-stratus	6,481	2,930	23.6	10.0
Alto-cumulus	3,105	2,931	9.4	21.3
Strato-cumulus	1,957	1,830	8.4	11.5
Cumulus	1,473	1,381	8.7	14.3
Cumulo-nimbus	1,202	1,552	16.8	12.9
Nimbus	712	.....	.....	.....
Stratus	583	503	6.2	.....

The following is the classification recommended by the committee:

Generally each class is divided into two varieties; (*a*), detached or rounded forms which appear chiefly in dry weather, and (*b*), widespread veil-like forms seen more frequently in rainy weather. Five main types are recognized:

A. Highest clouds, mean elevation 9,000 meters.

(*a*) 1. Cirrus, isolated feathery clouds.

(*b*) 2. Cirro-stratus, fine whitish veil.

*This date has recently been changed to August 1, 1896.—C. A.]

B. Intermediate clouds, elevation 3,000 to 7,000 meters.
(a) 3. Cirro-cumulus, fleecy clouds in small white balls and wisps.
(a) 4. Alto-cumulus, denser and larger fleecy clouds with shaded portions.
(b) 5. Alto-stratus, thick veil of gray or bluish color.
C. Low clouds, elevation less than 2,000 meters.
(a) 6. Strato-cumulus, large balls or rolls of dark cloud.
(b) 7. Nimbus, rain clouds.
D. Clouds formed by the diurnal ascending currents.
8. Cumulus, wool-pack clouds, elevation of base 1,400 meters, apex 1,800 meters.
9. Cumulo-nimbus, thundercloud; elevation of base 1,400 meters, apex from 3,000 to 8,000 meters.
E. Elevated fog, below 1,000 meters.
10. Stratus, lifted fog.

A more detailed description of the cloud forms classified above will be found in Instructions for Observers of the Weather Bureau, page 18. Washington, 1895.

Name of cloud.—The kind or name of the cloud in any particular case must be decided upon by the observer's own judgment. Instrumental means are unavailable in observing this element. Some of the remaining items in the above list of elements can be observed more or less perfectly without instrumental aid, but others require instruments, and all are much better made by their use. A single instrument suffices for making all the measurements, although special devices are more generally employed in measuring the height of clouds, owing to the need of greater accuracy.

The improved nephoscope.—The instrument employed for general cloud observations is called a nephoscope. Many forms of this instrument have been devised and used, but, with scarcely an exception, they consist of a horizontal mirror so arranged that the reflected image of the cloud in question is observed. In most, or all of the forms with which the writer is familiar, the utility of the instrument is limited more or less, and although some of the elements mentioned above can be observed in a satisfactory manner, others can not be determined at all, or are observed with difficulty or inaccurately. Many forms of nephoscope are inconvenient to use, and the deduction of final results involves unnecessary numerical computations. In the instrument described below, which was devised for the use of the Weather Bureau observers, the writer has sought to extend the utility of the nephoscope to the observation of every possible element; to insure a uniform degree of accuracy; to provide that the manipulation shall be as convenient as possible, and to choose such dimensions that the numerical computations incident to the reduction of observations shall be reduced to the minimum. The writer desires to acknowledge his indebtedness to Prof. Cleveland Abbe for many valuable suggestions.

The instrument is shown in Fig. 1, as arranged for general cloud work. The circular frame, *A*, is mounted upon three leveling screws, and its upper surface is graduated to degrees, numbered from 0 to 360, the numbers increasing in a direction contrary to the direction of motion of clock hands. This direction is adopted at the suggestion of Professor Bigelow, as this sequence of angles conforms to that which obtains in the ordinary conception of trigonometrical functions, as also in the positive cyclonic rotation, and in magnetic elements. The plate and mirror, *M*, revolve smoothly within the circular rim *A*, being carried upon a hollow vertical axis at the center. The arm, *B*, carrying the sighting staff, *S*, also revolves upon the central axis, the outer end traversing the narrow annular space between the mirror and graduated rim. The staff, *S*, is telescopic in construction, and is attached to the arm at *B* by a hinge which permits the staff to be inclined from the vertical to any extent, but always in a plane perpendicular to the mirror. The top portion of the staff is provided with a crosshead, which is surmounted by a small sighting knob, *s*. The crosshead is adapted to receive the secondary staff, *S'*, which slides with gentle friction through the crosshead, and is tipped at either end with small secondary sighting knobs, *s'* and *s''*. By reason of the telescopic construction of the staff, *S*, the crosshead can not only be turned about in any direction, but it and the sighting knob, *s*, can be raised by various amounts, being held in place by friction. The hinge at *B* is made in such a manner that when the staff, *S*, is placed in a vertical position the small rod sliding inside can be forced down into a hole in the hinge, the effect of which is to lock the hinge so that the staff is held rigidly in a vertical position. The purpose of this arrangement will appear when the manner of using the nephoscope for observing apparent cloud velocities is described.

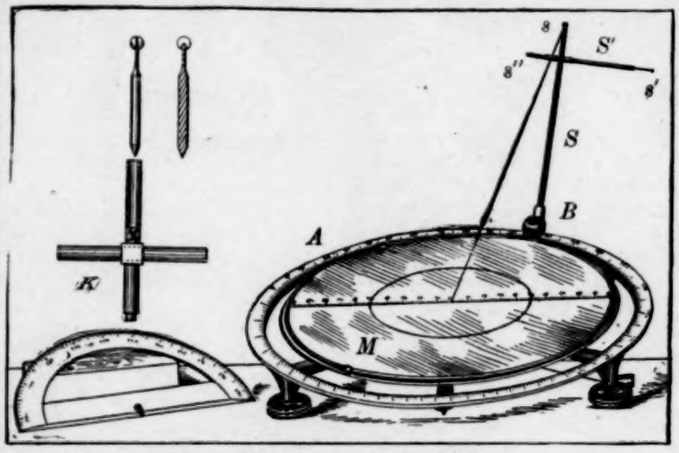


FIG. 1.—The Improved Nephoscope.

A fine line crossing the center of the mirror is etched upon the surface of the glass, and is graduated into millimeters, the zero of the scale being placed at the center. The radius of the mirror is slightly more than 10 centimeters (4¼ inches). Two circles, of 5 centimeters and 10 centimeters radius respectively, are also engraved on the glass.

The center of the glass is pierced with a fine pin hole. A short length of silk twist is passed through this and the hollow axis of the instrument, and has attached to it below a small weight, whereas, the end above the mirror is fastened to the sighting knob, *s*. The thread is kept taut at all times by the small weight below, and if detached from the staff, *S*, is prevented from passing entirely through the mirror by the knob at the end. When in use, the nephoscope is mounted upon a hollow support, most conveniently made with iron piping, thus providing a sufficient space for the movements of the small weight which is a convenient, although not a necessary, adjunct, as the result may be obtained in other ways. The weight is so formed that when not required, or for security in transportation, it may be screwed within the hollow axis of the nephoscope.

The knob, *s*, is shown enlarged at *K* in the figure, the construction there shown being adopted in order that the line of the silk thread shall range accurately with the center of the mirror and the center of the sighting knob, in whatever position the staff may be placed and however the crosshead may be turned. It will be seen from the figure that the sighting knob, *s*, above the crosshead is formed of a separate piece pointed at the lower end, upon which it pivots within the upper portion of the cross. By this construction the thread is prevented from winding around the staff when the latter is rotated. The round knob at the extreme top is slotted so that the thread always draws from the center.

The object of the thread is to facilitate the measurement of the angular altitude of a cloud. In the use of the instrument, the angle between the thread and the mirror is the angular elevation of the cloud observed, which, for most purposes, can be measured with sufficient accuracy by the use of an ordinary semicircular protractor of about 10 centimeters radius (3½ to 4 inches). The one shown at the side of the figure is provided with a small, pointed projection at the center of the arc. When applied to the mirror so that the point enters the small hole in the center, the angle of the thread may be read off with a very considerable accuracy.

A small level of the usual construction accompanies each instrument, and, if desired, can be permanently attached, although the detached level is believed to be better, and possibly less expensive.

Thus constructed the nephoscope becomes a very accurate cloud altazimuth, and is useful in many other kinds of observation where horizontal and vertical angles are to be measured, such as auroras, halos, kites, wind vanes, etc.

For the best results each instrument should be provided with two mirrors. The one for general use should be made of black glass, ground true and flat. A splendid substitute for the black glass, which is rather difficult to procure, consists of an ordinary piece of clear glass such as is used in mirrors, but from which the silvering has been removed and the surface coated evenly with perfectly black paint. The top surface of such a glass becomes a partially reflecting surface. The loss in brilliancy from the partial reflection is of great advantage in observing strongly illuminated clouds. Nothing more than such a mirror is required, except, in rare cases, when the clouds are dark and are devoid of any distinct and well-defined markings. A silvered mirror reflecting strongly from the top surface is then required. The ordinary mirror, silvered on the back, gives rise to double reflections that, at times, become troublesome.

Exposure.—For repeated and frequent observations some convenient and stable support should be provided and established at a point commanding an uninterrupted view of the sky. The nephoscope is to be placed upon its support so that the zero of the graduated circumference is set to the south point of the horizon. This adjustment being once established, it is convenient to provide that the points of the leveling screws of the nephoscope fall, respectively, the one within a conical hole, another within a V-groove, and the third resting upon a flat surface. When returned to this support after removal the adjustment of the instrument to the south point is preserved.

Methods of observation.—The manner of using the nephoscope will be understood from a description of the method of observing each of the elements given in the list above.

The theory of the nephoscope requires that the mirror be accurately horizontal. This condition is secured in a satisfactory manner by means of the leveling screws, aided by the small level accompanying the instrument.

Passing element number (1) on the list—that is, the name of the cloud, which, as we have seen, must be determined directly—the manner of observing the azimuth of a cloud will be described:

(2). Looking at the mirror of the nephoscope, the image of the desired cloud is found, and the observer moves his head until the middle of the cloud image, or whatever point is to be considered, is seen at the very center of the mirror, which is marked by the small hole through the glass. It is necessary of course to avoid double vision by using one eye only. Keeping the cloud image always at the center of the mirror, the sighting staff, *S*, of the nephoscope is revolved about the central axis and inclined until the small sighting knob, *s*, is likewise seen reflected with the cloud from the center of the mirror. At this moment of time the azimuth of the cloud is the reading on the graduated circle opposite the index attached to the base of the sighting staff.

(3). The angular altitude of the cloud is likewise shown from the setting we have just described—that is, the angle made by the thread as it stretches from the center of the mirror to the center of the sighting knob, *s*, is the altitude of the cloud when it is in range with the knob. This angle is measured by placing the straight edge of the protractor on the mirror with the pointed projection entering the hole in the middle of the mirror.

It will be noticed that thus far the sighting staff is *beyond* the center of the mirror from the observer, so that the reflected image of the staff appears in the mirror. It is also possible to have the staff on the side *next* to the observer, but in this case the adjustment must be made so that the knob, *s*, is in the direct line from the center of the mirror to the observer's eye. The angular altitude of the cloud is given just the same as before, by this method of observing, but the azimuth of the cloud will be 180° different from the reading of the azimuth circle. The first described method is preferable.

(4). *Azimuth of motion of cloud.*—The direction in which the cloud is moving is obtained with the nephoscope as follows:

The cloud in question is brought in range and the sighting knob, *s*, adjusted exactly as described under (2). Unless the cloud is moving very slowly, the image in a very few seconds will be seen to move away from the center of the mirror. Two methods of following the image are now open to the observer:

First method.—Follow the motion of the cloud by keeping the images of the knob and the cloud together, not by moving the sighting staff, which under no circumstances must be changed from its first position, but by moving the head. As the cloud image thus appears to traverse the mirror from the center to the circumference, the mirror is turned upon its axis so that the line of graduations across its surface appears to intersect the cloud and the knob, *s*. When it is found that this line has been set to coincide with the path of the cloud image—that is, when the cloud follows along the line—then the latter is parallel to the direction of the cloud motion. Before describing the manner of reading off the azimuth of the motion, the second method will be given, as follows:

Second method.—Instead of moving the head so that the cloud and the knob may be kept together on the mirror, the head may be kept stationary, that is, the head is held so that the knob is seen always at the center of the mirror. The cloud image will now, even more rapidly than before, appear to move toward the edge of the mirror, which, as before, must be turned until the graduated line is so placed that the cloud appears to follow it closely. Here, again, the line is in the same direction as the cloud motion.

The actual position of the line should be the same whether the cloud image was followed by the first or second method. After following the cloud toward the edge of the plate the reading on the graduated rim, where the cloud appears to pass off the plate, will be by the first method, the direction whence the cloud came, but by the second method the direction toward which the cloud is moving.

The two methods contrasted.—In the first method the speed with which the cloud image traverses the plate depends upon the height of the knob above the mirror. As this is always less than the height of the head above the mirror the apparent speed will be much less by the first than by the second method. The first method is, therefore, not so well adapted to determine the direction of motion of very high or very slow moving clouds, nor those whose forms change greatly in a few seconds. In general, the second method will be best to employ where directions of motion only are desired.

It is important that the different results obtained by the two methods be not confused in case observations are made

in both ways. In observing the apparent velocity of clouds the first method of following the cloud image must alone be used, and while in general the second method is best where directions of motion only are desired, observers will, perhaps, avoid confusion and errors by making both classes of observations by the first method.

It will be noticed here that having adjusted the nephoscope on the cloud, and having set the line on the mirror to coincide with the direction of cloud motion, these operations have determined each of the three elements (2), (3), and (4); that is, the reading on the graduated rim opposite the base of the sighting staff is the azimuth of the cloud; the angle between the thread and the mirror is the angular altitude of the cloud; and finally, the direction of motion is determined from the position of the line on the mirror.

(5). The observation of the apparent velocity of the cloud is attended with a little more complication than any of the preceding elements. It consists in following the cloud image according to the above-described first method, and in noting the number of divisions on the graduated line traversed in a stated number of seconds, for example, 30 seconds. Instead of this we may note the number of seconds required for the cloud image to traverse a fixed distance on the plate, say, for example, from the center to the edge, or half-way to the edge. The two circles engraved on the mirror are for this purpose. In order that the apparent velocity of one cloud may be compared with that of another it is necessary that the vertical distance of the sighting knob above the mirror be constantly the same, or, if different, that the height be known.

Furthermore, the actual velocity can be determined from the apparent velocity when the height of the cloud is known. From many observations that have already been made it has been discovered that there is quite a definite relation between the heights of clouds and their appearance. These relations are roughly indicated in the cloud classification already given, and more accurately in the table of heights and velocities. It therefore results that observations of apparent cloud velocities by the nephoscope can be made to give very fair ideas of the actual velocities of the clouds themselves, and the nephoscope described above has been arranged with particular reference to this use.

For this purpose the hinged joint is locked, in the manner already described, so that the sighting staff assumes its vertical position. The knob, s, is now disregarded and the clouds are sighted with reference to the knobs, s', or s'', according to convenience. The arm, S', slides easily through the crosshead, and can be revolved about the vertical staff, S, which motions, together with the rotation of the staff around the central axis is always sufficient to bring the knobs in range with any cloud, except it be of low elevation (under 20°). The observation of such low clouds is not altogether desirable. The knobs, in whatever position set, are always a constant distance above the mirror, namely: 4.73 inches (12 cm.). The line engraved across the mirror is graduated to millimeters. Accepting these dimensions it will be found on computation that the number of millimeters traversed by a cloud image in 30 seconds will be the velocity of the cloud in miles per hour, provided, the cloud is just one mile high. If the cloud is two miles high the velocity will be double, and so on in like proportion for other heights.

This same relation holds equally well for any other system of units, for example, the space traversed by the cloud image in 30 seconds measured in millimeters is the velocity in kilometers per hour of a cloud 1 kilometer high.

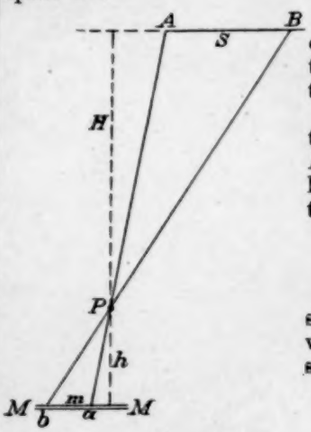
In order to obtain the velocity in meters per second on the basis of a cloud 1,000 meters high, it is necessary to time the cloud for 25 seconds. One-third the space traversed on the millimeter scale of the mirror is then the velocity in meters per second.

These explanations show the advantage of exercising a proper choice in selecting the dimensions of the parts of the nephoscope, and how simple the computation of actual cloud velocities then becomes.

Owing to the slow motion of the cloud images in some cases, the rapid motion in others, or the rapid change of the cloud forms in still others, it may not always be possible to observe the motion for just the specified time. In such cases the time may be halved or doubled for example. At any rate, the method of observation outlined above forms a good basis for general work in observing apparent cloud velocities.

The relations which exist between the actual velocity of a cloud and the velocity of its image in the nephoscope are brought out in more detail in the following explanation:

The cloud is supposed to move in a horizontal direction, such as $A\ B$ in the diagram. Its image in the horizontal mirror, $M\ M$, sighted in reference to the knob P, traverses the space $a\ b$.



Let S = space traversed by the cloud in time t, and let m = space traversed by the image in the same time.

Let H = height of cloud above the point P; let h = height of point P above mirror; also, let V = velocity of the cloud. Now from the principles of mechanics:

$$V = \frac{\text{Space}}{\text{time}} = \frac{S}{t}$$

But from the properties of the similar triangles PAB and Pab, whose altitudes are H and h, respectively,

$$S = m\frac{H}{h} \quad \ldots\ldots\ldots (a)$$

Introducing this in the equation above we have for the general equation of velocity:

$$V = \frac{m\,H}{t\,h}$$

We can now measure the quantities entering this equation (a) in any units whatsoever, according as we desire to express the velocity in (1), miles per hour; (2), kilometers per hour; or (3), meters per second, etc. Moreover we can select such values of t and h, and employ such units of measurement for m that for a convenient height (H=one mile, one kilometer, or 1,000 meters, for example) V may be made numerically equal to m, or, at most, the two shall be in some such simple relation as $V = \frac{1}{3}\,m$, as already found.

The computations by which these results are obtained are given for the separate cases, as follows:

1. For velocity in miles per hour.

In all cases it will be necessary to measure t in seconds, and it has been found most convenient to measure both m and h in millimeters. For miles per hour in the case of a cloud 1 mile high, we must consider that there are 3,600 seconds in 1 hour. In this case equation (a) may be written:

$$V \text{ in miles per hour} = \frac{3{,}600\,m}{t\,h}$$

Now h and m may be measured in any units so long as the same unit is employed for both. Millimeters are therefore sufficient, and it is plain that if we make t multiplied by h = 3,600, we shall have the exceedingly convenient and simple relation: $V = m$.

This is accomplished if we take t=30 seconds and h = 120

mm., both numbers fortunately are very convenient and suitable for their respective purposes.

2. For the case of kilometers per hour, it is plain that in the same manner as in (1) the equation of velocity becomes:

$$V \text{ in kilometers per hour} = \frac{3{,}600\, m}{t\, h}$$

and that here again, as before, $V = m$, when t is 30 seconds and h is 120 mm.

3. Finally, for the third case of meters per second the general equation of velocity becomes for a cloud 1,000 meters high:

$$V \text{ in meters per second} = \frac{m}{t\, h}\, 1{,}000$$

The best that can be done in this case, still retaining $h = 120$ mm. is to make $t = 25$ seconds, whereupon:

$$V = \frac{m}{3{,}000}\, 1{,}000;\ \text{or} = V\frac{m}{3}$$

(6). We now come to the consideration of the measurement of cloud heights. This is really a matter of great difficulty, and the present discussion will be confined to explaining how measurements of this sort can be somewhat imperfectly made with the nephoscope. For this purpose two stations may be established within sight of each other and at a known distance apart. A mile or more is necessary for high clouds, but for nephoscopic observations upon clouds of moderate elevations a less distance between stations may be fairly satisfactory. The zero points of the graduated rims of the nephoscopes had best be set exactly on the line between the two stations, although this is not necessary if the azimuth of this line is taken into account.

The observations require that the observers at the two stations shall first decide upon some particular cloud, or spot on the cloud, to be measured. Telephonic communication is quite indispensable for this purpose. When a mutual identification of a spot has been reached each observer measures with his nephoscope the altitude and azimuth of the spot at the same moment of time. The mathematical computation by which the height of the cloud is deduced from such observations is rather complex and need not be given. The height of the cloud may be determined in a mechanical way, as follows: Lay off a line on the floor having a length corresponding to the distance between the stations. A scale of 1 inch to 100 feet will be convenient. Tack strings to the floor, one exactly at each end of the line. Stretch these strings up through the air so that the angular altitude above the floor corresponds to the altitudes obtained from the observations of the two nephoscopes, respectively. The threads must also make the same horizontal angles with the base line as found from the observation of the azimuth of the cloud. If the two observers sighted at the same point of the cloud and the strings were nicely adjusted, they should intersect at a point above the floor. This point represents the cloud and its vertical distance above the floor, measured on the same scale as the base line, for example, 1 inch equals 100 feet is the desired height of the cloud. Generally, the strings will fail to intersect, which means that the two observers were not looking at the same point. If the discrepancy is not too great, the height of the cloud may be measured from a point midway between the strings where they are nearest together.

The averages of several observations are necessary to get fairly good altitudes. Generally, however, it is necessary to employ theodolites in order that the angles may be measured with greater accuracy and photography is called in to obviate the difficulty of fixing upon a definite point of observation.

NOTES BY THE EDITOR.

THE NEW ENGLAND METEOROLOGICAL SOCIETY.

The Editor has received from Prof. Wm. M. Davis, Secretary of the New England Meteorological Society, a notice stating that the thirty-sixth regular meeting of the Society was held at Boston on April 25, 1896, at which, after reading a number of excellent papers by Rotch, Fergusson, Clayton, and Very, the question of the dissolution of the Society was considered. The Secretary reported that—

Thirty-nine members of the Society, not present at this meeting, had sent in written ballots, 32 being in favor of dissolution, and 7 in the negative; a number of members not voting. It was then moved:

1. That when this meeting adjourns, it adjourns *sine die*, and that the Society be thereby dissolved. This motion was carried by 8 affirmative againt no negative votes.

The following recommendations of the Council were then voted:

2. That notice of the votes of this meetlng be sent to all members of the Society.

3. That any unexpended balance remaining in the treasury of the Society, after the payment of its obligations, be spent under the direction of Messrs. W. H. Niles, W. M. Davis, and R. de C. Ward, for some meteorological purpose.

4. That notice of the dissolution of the Society be forwarded for publication in the U. S. MONTHLY WEATHER REVIEW, New England Climate and Crop Bulletin, American Journal of Science, Science, Nature, and the Meteorologische Zeitschrift.

5. That any undistributed copies of the Society's investigations be presented to the Astronomical Observatory of Harvard College, to be disposed of by gift, exchange, or otherwise, as shall seem most advisable to the Director of that Observatory.

6. That any publication hereafter received, addressed to the Society, shall be presented to the library of the same Observatory.

On motion, the Society adjourned *sine die*.

Almost simultaneously with the above notice comes the news that the American Meteorological Journal will be discontinued with the completion of Volume XII. We have here two events that mark an unfortunate epoch in the history of meteorology in America.

The support of the Journal and the Society has, perhaps, fallen too heavily upon a few persons to whom all must be grateful for their faithful work. The discontinuance of both leaves a gap that ought to be promptly filled. Meanwhile, the weekly journal, Science, has, to a limited extent, opened its columns to communications on meteorological subjects, and those meteorological observers who desire to extend their knowledge of what is going on in this branch of science will have to consult that periodical, as it is the only one in America that now gives prominence to this subject.

MEXICAN CLIMATOLOGICAL DATA.

In order to extend the isobars and isotherms southward so that the students of weather, climate and storms in the United States may properly appreciate the influence of the conditions that prevail over Mexico the Editor has compiled the following table from the Boletina Mensual for January, 1896, as published by the Central Meteorological Observatory of Mexico. The data there given in metric measure have, of course, been converted into English measures. The barometeric means are as given by mercurial barometers under the influence of local gravity and therefore need reductions to standard gravity, depending upon both latitude and altitude; the influence of the latter is rather uncertain, but that of the former is well known. For the sake of conformity with the other data published in this REVIEW these corrections for local gravity have not been applied.

Mexican data for January, 1896.

Stations.	Altitude.	Mean barometer.	Mean temperature.	Relative humidity.	Precipitation.	Prevailing direction.	
						Wind.	Cloud.
	Feet.	*Inch.*	° *F.*	%	*Inch.*		
Aguascalientes	6,112.3	.....	.....	.....	.....	.....	.....
Campeche	40.4	.....	.....	.....	.....	.....	.....
Colima (Seminario)	.....	.....	71.4	69	.....	.....	sw.
Colima	1,291.7	.....	73.8	.....	.....	.....	.....
Culiacan	112.2	29.84	68.0	67	0.76	.....	.....
Guadalajara (H. de B.)	5,141.2	25.32	57.6	82	0.08	w.	.....
Guadalajara (Obs' d. Est.)	5,186.4	.....	.....	.....	.....	.....	.....
Guanajuato	6,761.3	23.69	57.6	48	0.01	wsw.	sw.
Jalapa	4,757.3	25.58	58.6	.....	0.94	nnw.	.....
Lagos (Liceo Guerra)	.....	24.16	56.8	48	0.06	sw.	sw.
Leon	5,901.0	24.31	57.0	43	0.11	ssw.	sw.
Mazatlan	24.6	29.98	70.0	78	1.75	nw.	sw.
Merida	50.2	30.03	70.7	70	0.01	ne.	n.
Mexico (Obs. Cent.)	7,488.7	23.08	55.0	54	0.02	nw.	sw.
Mexico (E. N. de S.)	7,480.5	23.12	55.4	61	0.02	.....	.....
Morelia (Seminario)	6,401.0	23.98	55.6	62	0.43	ssw.	sw.
Oaxaca	5,164.4	25.10	64.6	54	0.00	w.	e.
Pabellon	6,312.4	.....	.....	.....	.....	.....	.....
Pachuca	7,956.3	22.63	53.8	71	0.00	nne.	ne.
Progreso	.....	.....	.....	.....	.....	.....	.....
Puebla (Col. d'Est.)	7,118.2	.....	.....	.....	.....	.....	.....
Puebla (Col. Cat.)	7,112.0	23.39	57.2	52	T.	nne.	sse.
Queretaro	6,069.7	24.20	57.2	50	0.20	e.	.....
Real del Monte (E. de H.)	9,095.2	.....	.....	.....	.....	sw.	.....
Saltillo (Col. S. Juan)	5,376.7	24.89	56.5	58	0.12	sw.	.....
San Luis Potosi	6,201.9	.....	.....	.....	.....	.....	.....
Silao	6,063.1	.....	.....	.....	.....	.....	.....
Tacambaro	.....	.....	.....	.....	.....	.....	.....
Tacubaya (Obs. Nac.)	7,620.2	22.98	54.3	56	T.	nw.	.....
Tampico (Hos. Mil.)	.....	.....	.....	.....	.....	.....	.....
Tehuacan	5,152.8	.....	.....	.....	.....	.....	.....
Toluca	8,612.4	21.91	49.5	55	0.00	wsw.	sw.
Trejo (Hac. Silao, Gto.)	.....	.....	.....	.....	.....	.....	.....
Trinidad (near Leon)	6,010.1	.....	.....	.....	.....	.....	.....
Veracruz	47.9	.....	.....	.....	.....	.....	.....
Zacatecas	8,015.2	22.61	53.6	47	0.27	sw.	.....
Zapotlan (Seminario)	5,124.8	25.08	62.6	.....	2.00	se.	sw.

COLD AIR IN LOW LANDS.

Mrs. L. H. Grenewald, the highly-esteemed voluntary observer at York, Pa., calls attention to the great discrepancy between the minimum temperatures occasionally observed at Harrisburg, Philadelphia, and York, of which the following are illustrations:

The morning minima of March 13, 1896, were as follows: Pittsburg, +8°; Philadelphia, +16°; Harrisburg, +8°; York, —6°; Washington, +14°.

The minimum at York was the lowest recorded since February 3, 1895. The temperature remained below freezing all day, but as the wind was nearly calm this extreme sensible temperature was less apparent. The maximum temperature on the same day at York was +29° and the mean temperature 12°. The sky was cloudless and the humidity about 70 per cent. A heavy snowstorm had occurred on the 11th and 12th and the ground was, therefore, covered with snow throughout the neighborhood.

The minima of the 14th were: Pittsburg, +14°; Philadelphia, +13°; Harrisburg, +6°; York, —6.2°; Washington, +14°.

On this day, in the morning, the sky was clear and the wind at 8 a. m. a light west at Philadelphia, but at York it was still calm with a clear sky. York is about 25 miles southeast of Harrisburg, 50 north of Baltimore, and 80 west of Philadelphia. York is less than 500 feet above sea level, and the hills of 1,000 feet or more in elevation that form the eastern border of the Appalachians are distant 25 miles to the north and northwest, 60 miles to the west and 40 miles to the southwest. During still nights a gentle flow of wind down the Susquehanna Valley prevails in the neighborhood of Harrisburg while a calm prevails in the neighborhood of York. The weather maps of the 13th and 14th show that after the storm of the 12th had passed rapidly northeastward along the middle Atlantic Coast there was a slight inflow of cold, dry air over Pennsylvania so that the isotherm of 20° passing northeastward through Harrisburg at 8. m. of the 12th moved a little farther south and east. On the morning of the 13th clear weather prevailed over Pennsylvania and neighboring States, with light northwest winds and rising pressure. On the 14th, 8 a. m., light winds from the northwest or southwest prevailed, the pressure had risen to 30.60 or 30.68 and the region between Lynchburg and Harrisburg was approximately the center of the area of high pressure.

It is a matter of common observation that within the areas of highest pressure there usually are not only clear sky, calms, or light winds and low temperatures, but many limited localities within which temperatures occur that are abnormally low. The locations of these cold spots depend upon combinations of several favorable circumstances, namely: (1) The atmosphere of this region is in a general state of descending motion, the descent is very slow and is due to the general coldness of the air, but specific portions of the atmosphere may be colder than others so that here and there may occur downpours of cold air from above. (2) When this air reaches the ground it still continues to cool if the ground is cold as is, of course, the case at nighttime, but if the ground is warm, as in the daytime, the air may become warmed and rise up by its buoyancy and make room for other colder air to come down; thus in the daytime the air near the ground is kept cool notwithstanding the sunshine while at nighttime it grows colder in proportion as the nights are longer and this is peculiarly true when the ground is covered with a layer of snow, as this cuts off all conduction of heat from below. During the nighttime the only important process at the surface of the ground is that of the radiation of heat. Heat is sent off in all directions through the air above us into the space beyond in a manner precisely similar to the radiation of light and just as light passes through clear air with only a slight absorption so also with heat. The air in contact with the soil may receive heat from it if the soil be warmer, but will give up heat to it if the soil be colder, provided it comes in contact with it. This process of conduction of heat from the air to the soil, to the foliage of plants and every other solid object goes on especially during clear cold nights, because on those occasions the heat received by solid objects can be radiated directly back into space. Such solids are, therefore, the mediums by which heat is taken from the air and then radiated through the air. The dust floating in the atmosphere and the globules of water forming clouds perform a similar office. If now in any quiet valley the air has only the gentlest perceptible motion, or if on an open plain the air rests stagnant all night, so that no great quantity of fresh heat is brought to the soil and foliage these latter will continue radiating and cooling as rapidly as the natures of the surfaces allow and will reach a minimum temperature that will depend largely upon the clearness of the sky, the amount of wind, their individual exposure to the sky, and the nature of their individual surfaces.

The cooling by radiation on a still, clear night can attain a very surprising amount. In India it has for ages been the custom to manufacture artificial ice by exposing water in pans, at nighttime, when the ordinary temperature of the air is far above freezing. Anyone may experimentally convince himself of the low temperatures produced by radiation if he will lay a thermometer on the top of several thicknesses of cotton wool or down or fur and set this arrangement under the open sky on a clear, still night. It is best to lay this preparation in a pan or shallow box so that a layer of cool air may rest quiet just above the thermometer. Under these conditions the morning minimum will be much lower than if the minimum thermometer had merely been fastened up against the inside of an ordinary shelter. Such a thermometer is one form of "radiation thermometer," and the temperature thus obtained is not the general temperature of the air, and it may not even be the general temperature of the air within the shallow box or the temperature of the upper

surface of the cotton wool. It is simply the temperature of the thermometer bulb itself, and is the difference between its radiation outward and the radiation inward. By covering the bulb with different substances we get effects depending upon the radiating powers of those substances.

As radiant heat is always flowing towards every exposed object, and is also flowing from that object out in all directions, we must be on our guard against its effects whenever a thermometer is to be used. A thermometer hung up in the middle of an ordinary room in which the air is perfectly still does not give the temperature of the air, but an average of the temperatures of the interior surfaces of the walls of the room, and this is wholly the influence of radiation. If we wish the thermometer to give us the temperature of the air itself, we must set the air of the room into rapid motion past the thermometer, so that it shall come into contact with the latter. When this is done the thermometer will assume a temperature that is an average between the temperature of the walls and the air. If now we wish to completely cut off the influence of the walls, we must put a small shelter around the thermometer, such as a tube through which the air of the room may be drawn; a double thin-walled tube is necessary, and a rapid ventilation, if we would annul the effects of obnoxious radiations.

In meteorological observations there are a number of objects to be attained, each of which requires a special instrument. There is the radiation thermometer, which gives us the lowest temperatures of the surface of the ground, or of the foliage at nighttime; the black and bright bulbs in vacuo, for getting the intensity of sunshine; the wet bulb, which gives the temperature of evaporation of the surface of water, and, finally, there are the air thermometers, which are intended to give us the temperature of the air at any given spot. The physician needs to know the temperature of the air in which we live, the agriculturist needs the temperature of the soil and the temperature of the leaves of the plants, but the meteorologist wishes the temperature of great masses of air in the free atmosphere. In order to attain this latter temperature the Weather Bureau thermometers are placed high up, above tall buildings, where the wind will strike them freely, and in a light, open, wooden shelter, so that neither sunshine by day nor radiation by night can affect them. Under these circumstances it is found that the air at a hundred feet above the earth's surface does not go through the same changes in temperature that are experienced near the surface; it is neither so warm in the daytime nor so cold at nighttime; the midday maximum temperature is below that near the surface, while the morning minimum is oftentimes far higher than at the earth's surface.

The low temperatures observed on March 13 and 14 at York, Pa., while much higher temperatures prevailed at Harrisburg, Baltimore and Philadelphia, undoubtedly resulted from a favorable combination of the following circumstances, namely: snow on the ground, clear sky, light winds and calms, all favoring intense local surface radiation at York, but less so in Washington, Philadelphia, and surrounding cities; a central area of high barometer favoring the local descent of cold air; the location of the thermometers near the ground in still air at York, but high above the ground in the free wind at Philadelphia, Harrisburg, and other stations.

Under similar conditions great discrepancies in the minimum temperatures at stations only a few miles apart have often occurred in other parts of the country, and local controversies have often arisen as to the errors of thermometers and the carefulness of the observers. A notable case of this kind occurred in 1882, when differences of 20° were recorded at stations a few miles apart in the Mississippi Valley. The explanation of these discrepancies was very simple as soon as it was ascertained that they occurred during a perfectly clear calm night, and that the warmer stations were on ground a hundred feet above the surrounding lowlands, which were covered with snow. In such cases no conclusions derogatory to the observers or their instruments can be drawn from the discrepancies that appear under such circumstances.

THUNDERSTORMS AND CLOUDS IN JAMAICA.

Mr. Maxwell Hall, Proprietor of the Observatory at Kempshot, in the Island of Jamaica, and well known as meteorological reporter to that colony, suggests that the following classification of clouds, which he finds very appropriate to his island, may be of wider interest. Adhering to the primary terms of Howard, namely, cirrus, cumulus, and stratus, he states that in Jamaica the average drift of these clouds is, respectively, from the east-northeast, the southeast, and the east. The combinations of clouds and descriptions given by him are as follows:

Cloud.	Description.
1. Cirrus	Fibrous threads; mares' tails.
2. Cirro-stratus	Thin sheets of fibrous texture.
3. Cirro-cumulus	Flakes; mackerel-back.
4. Strato-cirrus	Thick sheets of wooly texture.
5. Cumulus	Rounded solid masses.
6. Cumulo-nimbus	Cumulus discharging rain.
7. Alto-cumulus	Fleeces of wool; flock of sheep.
8. Alto-stratus	Watery veil.
9. Strato-cumulus	Long, rolling waves, parallel to the horizon.
10. Nimbus	Stratus discharging rain.
11. Stratus	Low horizontal sheets of smoke-like cloud.
12. Fracto-stratus	Fragments of stratus.

Mr. Hall states that a cumulus cloud in the summer months in Jamaica is often a gigantic mass, 10 miles in diameter and 6 miles high. As to the importance of separating the cirri that move from the east-northeast from the cumuli that move from the southeast, he says:

> With a slightly falling barometer and a cirro-stratus from the east-northeast, an observer would be justified in supposing that a cyclone was approaching Jamaica on the usual path from the Windward Islands, if it were not for the fact that cirro-stratus *generally* comes from the east-northeast at that time of the year. * * * As a rule, cirrus in its various forms is seen in Jamaica daily during the summer and autumn months, especially between 6 and 7 a. m., but is rarely seen during the rest of the year. * * * The cirro-stratus cloud consists of thin sheets of fibrous texture; the threads often interlace so that the cloud appears to be woven. Solar halos, mock suns, etc., are caused by the ice particles of which this cloud is composed. Cirro-stratus is always found to surround the advancing half of a cyclone, and hence its importance in forecasting the weather. * * * Fracto-stratus is the commonest cloud in Jamaica, winter and summer; its easterly drift is due to the trade wind; it extends upward to about one mile from the surface of the sea, but the lower 1,000 feet is greatly affected by land and sea breezes.

With reference to thunderstorms, Mr. Hall quotes the average number of days with thunder, as observed by the late Professor Houzeau, who lived at one time about 6 miles northeast of Kingston. The maximum average per month is 10 days in August, but Mr. Hall, from 20 years' experience, advises that these numbers must be accepted with caution, inasmuch as in thunderstorm months three or four separate storms may often be seen at the same time from a high station, like the Kempshot Observatory, so that the real number of thunderstorms for Jamaica is much larger than is indicated by Houzeau's table. As a rule, the heavier the rain the greater the thunderstorm; lightning easily strikes the earth through wet trees, and it is only in September that danger from lightning is to be apprehended. Hail does not often fall in Jamaica; tornadoes are almost unknown, and waterspouts are seldom seen at sea. It is believed that hail is often heard falling at a great height in the air, but reaches the ground as cold rain; at Kempshot, 1,773 feet above sea level, the temperature of the rain is about 65° F., which is below the usual daily morning minimum, and the anomaly of having a minimum reading occur at the hottest time of the

day is got over by resetting the minimum thermometer after every such shower. At sea level the temperature of the cold rain is about 75° F., which is above the early morning minimum at that level. Under normal circumstances, the temperature in Jamaica diminishes at the rate of 1° F. for every 315 feet, but when rain is falling from a thundercloud the diminution is 1° for every 177 feet.

RECENT HIGH BALLOON ASCENSIONS.

In the Comptes Rendus of the Paris Academy of Sciences for April, 1896, Vol. CXXII, page 849, Messrs. Hermite and Besançon give the principal results of the last scientific balloon ascension which started at 11.30 a. m., March 22, after consulting the weather predictions of the Central Meteorological Bureau. The small balloon with its apparatus weighed 32 kilos. (70 pounds), and started with a vertical pull of 106 kilos. (235 pounds); consequently the balloon rose perpendicularly for three or four minutes with a steadily increasing velocity. For nearly half an hour the balloon scarcely moved from the vertical, so that the velocity of ascent certainly exceeded 5 or 6 meters (16 to 20 feet) per second. After three and a half hours the balloon descended near Cambray. The self-registers show that it attained a maximum height of 14,000 meters (42,933 feet) within about forty-five minutes after starting, and a minimum temperature of —63° C. (—81.4° F.). The temperature at the surface of the earth beneath the balloon at that moment was +14° C. (+57.2° F.). Consequently the average rate of decrease was 1° C. (1.8° F.) for 182 meters (597 feet). This value does not much exceed that found in their voyage of October 20, 1895, when the ærostate at an altitude of 15,500 meters (50,854 feet) experienced a temperature of —70° C. (—94.0° F.), while the temperature at the surface of the ground was +11° C. (+51.8° F.). The registering thermometer has been tested in a very cold inclosure, and records properly down to —80° C. (—112.0° F.).

METEOROLOGICAL TABLES.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only the 8 p. m. observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation.

Table II gives, for about 2,700 stations occupied by voluntary observers, the extreme maximum and minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . . .).

Table III gives, for about 30 Canadian stations, the mean pressure, mean temperature, total precipitation, prevailing wind, and the respective departures from normal values. Reports from Newfoundland and Bermuda are included in this table for convenience of tabulation.

Table IV gives detailed observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, meteorologist to the Government Survey.

Table V gives, for 26 stations, the mean hourly temperatures deduced from thermographs of the pattern described and figured in the Report of the Chief of the Weather Bureau, 1891–'92, p. 29.

Table VI gives, for 26 stations, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891–'92, pp. 26 and 30.

Table VII gives, for about 130 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891–'92, p. 19.

Table VIII gives the danger points, the highest, lowest, and mean stages of water in the rivers at cities and towns on the principal rivers; also the distance of the station from the river mouth along the river channel.

Table IX gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division one may obtain the average resultant direction for that division.

Table X gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table XI gives, for 38 stations, the percentages of hourly sunshine as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table XII gives the record of excessive precipitation at all stations from which reports are received.

Table XIII gives a record of the heaviest rainfalls for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering rain gauges.

Additional information concerning the tables will be found in the REVIEW for January, 1895.

NOTES EXPLANATORY OF THE CHARTS.

Chart I.—Tracks of centers of low pressure. The roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. The queries (?) on the tracks show that the centers could not be satisfactorily located. Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available. A wavy line indicates the axis of a trough or long oval area of low pressure.

Chart II.—Tracks of centers of high pressure. The roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the

letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. The queries (?) on the tracks show that the centers could not be satisfactorily located. Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available. A wavy line indicates the axis of a ridge of high pressure.

Chart III.—Total precipitation. The scale of shades showing the depth of rainfall is given on the chart itself. For isolated stations the rainfall is given in inches and tenths, when appreciable; otherwise, a "trace" is indicated by a capital T, and no rain at all, by 0.0.

Chart IV.—Sea-level isobars, surface isotherms, and resultant winds. The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p, m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Professor Hazen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.

Chars V.—Magnetic phenomena. For further explanation of this Chart see the section on "Meteorology and Magnetism" in the text of the REVIEW.

Chart VI.—Depth of snowfall and limits of freezing weather. Total depth of snowfall is shown in inches. (T. = Trace.) The southern limit of freezing weather is shown by the frost line of minimum 40° F. — — — — and by the freezing line of minimum 32° F.————

Chart VII.—Depth of snow lying on the ground. The total depth of snowfall is shown in inches. T. = Trace. For the numerical details on which this Chart is based see Table II.

TABLE I.—*Climatological data for Weather Bureau Stations, January*, 1896.

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure in inches.			Temperature of the air, in degrees Fahrenheit.								Humidity and precipitation.				Wind.				Average cloudiness, tenths.				Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. +9.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.	Clear days.	Partly cloudy days.	Cloudy days.	Absolute maximum.	Year.	Absolute minimum.	Year.
New England.						24.3	2.0										1.68	2.4												
Eastport	76	23	30.02	30.11	+ .11	18.6	1.7	43	3	24	−13	6	14	29	7	61	0.84	3.2	10	11,546	n.	50	ne.	25	10	12	9	5.7	54	1892	−20	1874
Portland, Me	103	25	30.02	30.13	+ .08	20.6	0.5	43	3	27	−13	6	14	23	13	75	2.00	1.5	9	5,476	n.	28	w.	4	10	10	11	5.5	62	1890	−15	1887
Northfield	672	9	29.20	30.22	+ .15	13.2	1.6	39	3	21	−22	6	6	33	7	79	0.87	3.0	13	5,514	n.	40	sw.	1	5	11	15	6.9	61	1890	−36	1893
Boston	125	26	30.08	30.17	+ .10	24.9	0.5	45	3	31	−10	6	19	25	17	73	2.25	2.0	11	9,219	nw.	40	ne.	24	14	6	11	5.2	70	1876	−13	1892
Nantucket	145	26	30.08	30.13	+ .09	29.4	1.3	50	24	34	3	6	23	20	22	72	1.57	2.3	13	10,550	ne.	48	se.	30	5	14	12	6.4	56	1890	− 4	1886
Nantucket	14	10	30.12	30.13	+ .09	27.6	3.7	48	2	32	− 4	6	23	21	.....	.....	1.75	1.7	8	12,487	nw.	55	nw.	4	13	7	11	5.2	58	1892	− 8	1892
Woods Hole		19	.....	.....	.....	30.4	4.6	50	3	36	− 2	6	25	22	.....	.....	2.04	1.6	7	.....	nw.	.....	.....	.....	...	9	10	12	....	62	1890	− 7	1893
Vineyard Haven		10	.....	.....	.....	28.4	2.8	48	24	34	− 4	6	23	22	21	70	2.02	2.4	8	15,305	ne.	66	e.	24	4	15	12	6.3	59	1885	− 4	•
Block Island	27	16	30.14	30.17	+ .08	25.0	2.1	45	21	32	−11	6	18	33	.....	.....	1.59	3.7	6	.....	nw.	.....	.....	.....	19	1	11	....	63	1890	−11	1896
Narragansett Pier	.....	14	.....	.....	.....	25.0	2.0	45	3	31	− 8	6	19	29	17	74	1.82	2.4	8	7,845	n.	38	ne.	24	15	5	11	5.0	65	1890	−14	1873
New Haven	107	24	30.06	30.17	+ .08	31.3	1.6										1.67	1.9												
Mid. Atlan. States.						30.2	4.0	40	3	27	−14	6	14	34	15	83	0.98	1.8	8	5,535	n.	28	w.	27	7	11	13	6.5	62	1889	−18	1878
Albany	85	23	30.12	30.22	+ .12	27.6	3.3	47	25	33	− 3	6	22	22	20	75	1.25	2.6	6	11,077	nw.	48	ne.	24	12	8	11	5.5	67	1890	− 6	1875
New York	314	26	30.03	30.19	+ .07	29.3	1.0	53	30	34	6	6	24	23	24	80	1.00	2.7	5	5,964	w.	37	nw.	4	6	12	13	6.2	67	1890	− 4	1893
Harrisburg	377	8	29.79	30.22	+ .10	29.3	1.0	53	30	37	4	6	26	20	22	71	1.57	1.8	6	8,121	nw.	34	ne.	24	10	10	11	5.5	72	1890	− 5	1875
Philadelphia	117	26	30.07	30.20	+ .04	31.1	1.0	53	30	39	9	5	28	25	22	67	2.62	0.6	4	6,299	w.	35	ne.	24	9	10	12	6.3	73	1890	− 6	1881
Baltimore	142	26	30.04	30.20	+ .04	33.6	0.7	59	30	39	9	5	28	25	23	69	2.27	1.1	4	5,513	nw.	34	nw.	3	9	11	11	5.4	76	1890	−14	1881
Washington	112	26	30.10	30.22	+ .04	33.3	0.7	59	30	40	8	6	26	29	23	69	1.19	3.0	6	.....	nw.	.....	.....	.....	...	9	14	8	....	78	1876	6	1893
Cape Henry		23	.....	.....	.....	37.4	2.3	64	24	43	16	5	32	24	.....	.....	2.30	1.9	7	2,967	sw.	25	nw.	3	10	10	11	5.3	77	1890	− 6	1893
Lynchburg	685	25	29.45	30.22	+ .05	36.2	0.7	64	30	44	11	4	28	34	27	77	1.89	2.0	6	6,362	n.	42	nw.	4	14	6	11	4.8	80	1871	6	1893
Norfolk	87	26	30.14	30.21	+ .05	38.8	1.7	65	24	46	14	6	32	26	31	79	1.23	1.1													
S. Atlantic States.						44.4	2.5										2.26	2.1	6	5,049	e.	25	nw.	3	13	8	10	5.0	77	1890	− 1	1886
Charlotte	773	18	29.35	30.20	+ .02	40.1	1.1	63	30	48	14	5	32	24	29	70	4.03	2.2	7	11,272	n.	48	nw.	3	12	11	8	4.9	73	1890	14	1886
Hatteras	11	16	30.18	30.19	+ .03	41.8	3.8	60	17	46	21	5	37	18	37	87	2.77	2.6	9	11,634	n.	48	ne.	17	15	11	5	4.1	73	1876	9	1884
Kittyhawk	9	21	30.18	30.19	+ .02	39.0	3.2	64	24	44	16	6	34	24	33	80	2.87	0.7	5	4,771	n.	32	nw.	3	10	6	15	5.7	76	1890	2	1893
Raleigh	388	10	29.79	30.22	+ .04	39.1	2.4	66	30	47	14	6	31	30	28	68	2.87	1.5	5	5,704	ne.	34	ne.	17	12	12	7	4.8	80	1890	9	1884
Wilmington	78	26	30.12	30.21	+ .04	44.2	3.1	66	23	52	17	5	36	29	35	77	2.45	1.5	5	5,631	ne.	33	ne.	16	12	12	7	4.4	80	1879	10	1886
Charleston	52	26	30.17	30.22	+ .04	48.2	1.7	64	30	55	27	5	42	22	42	85	4.34	0.3	10													
Columbia	.....	9	.....	.....	.....	43.6	2.8	68	31	54	15	5	34	39	.....	.....	3.16	0.6	7	.....	ne.	.....	.....	.....	...	7	12	12	....	78	1890	10	1895
Augusta	190	25	30.00	30.20	+ .03	45.2	2.2	70	31	54	18	5	36	31	36	77	3.58	0.9	7	3,891	ne.	26	sw.	3	10	9	12	5.6	80	1890	6	1886
Savannah	98	26	30.10	30.21	+ .01	49.0	2.6	70	30	57	22	5	41	30	40	80	4.32	0.8	7	5,461	nw.	36	nw.	3	8	11	12	6.1	80	1879	12	1886
Jacksonville	43	25	30.13	30.18	.00	53.5	1.8	75	30	63	24	5	44	34	45	82	2.53	0.9	9	4,496	ne.	28	sw.	24	17	6	8	4.5	81	1888	15	1886
Florida Peninsula.						62.0	3.5										3.11	0.2												
Jupiter	38	9	30.12	30.15	− .01	62.3	4.7	80	23	69	40	1	55	24	54	81	5.06	0.9	13	7,063	nw.	27	s.	16	6	15	10	5.6	83	1895	34	1892
Key West	22	26	30.14	30.16	+ .02	66.4	4.0	79	23	70	55	8	62	12	59	79	0.90	1.2	8	7,901	ne.	37	n.	26	9	15	7	5.2	90	1877	41	1886
Tampa	36	6	30.14	30.18	.00	57.2	1.9	78	31	66	32	5	49	32	48	80	3.89	0.9	11	4,313	nw.	24	se.	23	11	14	6	4.9	82	1891	29	1893
						43.1	1.6										3.51	1.7												
East Gulf States.						41.8	0.7	67	31	49	14	4	35	26	35	83	3.12	3.2	10	7,656	nw.	35	nw.	3	10	7	14	5.6	75	1890	− 2	1886
Atlanta	1,131	18	28.98	30.22	+ .01	50.6	2.3	71	22	58	22	5	43	26	43	79	2.98	1.9	9	6,880	n.	37	nw.	22	10	8	13	6.0	79	1890	15	1886
Pensacola	56	17	30.14	30.21	+ .02	49.4	1.5	71	22	57	22	5	42	29	43	85	4.16	0.8	9	5,239	nw.	30	nw.	3	6	10	15	7.1	78	1882	11	1886
Mobile	57	24	30.14	30.19	− .01	46.0	2.2	73	31	54	19	4	38	30	39	82	6.10	1.1	8	4,726	nw.	25	se.	22	9	8	14	6.0	78	1890	5	1886
Montgomery	221	24	29.94	30.19	− .01	46.0	2.2	73	31	54	19	4	38	30	39	82	3.98	1.8	8	3,839	ne.	22	n.	3	6	4	21	7.5	79	1890	14	1893
Meridian	358	7	29.79	30.19	+ .01	44.6	2.5	70	31	52	16	5	37	34	37	82	3.96	1.5	9	5,407	se.	26	s.	2	6	8	17	6.8	82	1890	3	1886
Vicksburg	254	20	29.88	30.16	− .03	47.3	2.0	74	31	55	22	4	40	28	37	73	3.94	1.5	9	5,407	se.	26	s.	2	6	8	10	5.9	82	1890	15	1886
New Orleans	54	26	30.13	30.19	+ .03	52.2	1.6	76	31	59	28	5	46	28	45	82	2.33	3.1	10	6,501	nw.	30	n.	3	8	10	13	5.9	82	1890	15	1886
Port Eads	.....	10	.....	.....	.....	52.8	3.9	67	30	59	37	4	47	21	.....	.....	1.49	3.2	6	.....	n.	.....	.....	.....	...	8	4	19	....	.....	.....	.....	.....
						48.6	2.5										4.25	0.6												
West Gulf States.						46.0	2.0	72	11	54	19	4	39	34	37	75	8.11	3.2	10	5,123	se.	25	n.	3	7	6	18	7.0	78	1890	1	1886
Shreveport	249	25	29.89	30.16	− .03	41.2	4.8	70	11	49	14	4	33	37	33	77	1.89	0.5	10	4,683	e.	24	nw.	23	11	5	15	6.1	80	1890	− 7	1894
Fort Smith	481	14	29.69	30.16	− .02	41.2	4.8	70	11	49	14	4	34	31	32	75	4.85	0.2	9	5,114	n.	32	s.	2	8	7	16	6.5	78	1880	− 5	1886
Little Rock	302	17	29.85	30.19	− .01	41.4	1.1	66	11	48	15	4	34	31	32	75	2.41	1.5	12	7,259	ne.	36	se.	29	9	8	14	5.8	82	1892	16	1888
Corpus Christi	20	9	30.12	30.14	− .03	56.7	3.2	79	21	62	34	4	51	26	52	87	1.91	2.1	8	8,198	e.	35	ne.	23	12	5	14	5.6	75	1882	11	1886
Galveston	42	26	30.14	30.18	+ .03	53.2	0.9	68	2	57	32	4	49	18	47	82	7.67	3.3	9	4,951	ne.	28	sw.	2	5	14	12	6.7	79	1894	0	1886
Palestine	510	14	29.61	30.18	− .02	47.9	2.7	73	10	56	20	4	40	34	38	75	2.90	1.3	13	5,843	n.	37	n.	25	6	12	13	4.5	81	1886	6	1886
San Antonio	704	17	29.40	30.16	− .01	54.0	2.5	80	21	64	27	4	44	41	39	66	1.88	2.6													
Ohio Val. & Tenn.						35.7	2.3										2.90	4.2	9	5,092	w.	28	w.	1	7	9	15	6.4	75	1890	− 7	1886
Chattanooga	762	18	29.39	30.22	+ .08	41.6	0.4	64	31	49	12	4	34	28	32	74	1.49	4.3	7	3,681	ne.	35	sw.	2	16	3	12	5.1	74	1876	−16	1884
Knoxville	980	26	29.13	30.22	+ .02	40.4	2.3	64	•	49	10	4	32	29	30	72	4.32	1.5	15	6,901	ne.	30	s.	2	7	8	16	6.4	79	1890	− 8	1886
Memphis	399	25	29.74	30.18	− .01	41.8	4.4	65	11	48	14	4	30	25	33	74	1.37	4.0	10	4,799	se.	28	se.	22	9	8	14	6.3	75	1890	−10	1884
Nashville	545	26	29.59	30.20	+ .03	39.6	2.7	63	31	46	10	4	33	29	31	76	1.25	2.9	10	8,590	sw.	36	s.	2	0	8	23	8.6	71	1890	−12	1895
Lexington	989	13	29.09	30.19	+ .06	34.4	3.4	60	31	41	0	4	28	29	27	77	0.82	3.4	10	5,854	n.	27	nw.	3	3	9	19	7.6	72	1890	−20	1884
Louisville	525	25	29.61	30.20	+ .02	35.6	3.0	61	23	43	3	4	29	28	28	80	1.60	1.6	15	4,420	se.	20	nw.	3	5	9	17	7.3	70	1890	−25	1884
Indianapolis	766	25	29.34	30.20	+ .04	30.0	3.0	55	30	36	− 5	4	24	28	24	80	1.49	2.0	11	5,838	nw.	27	nw.	3	7	10	14	6.6	71	1890	−12	1886
Cincinnati	628	26	29.51	30.22	+ .05	33.6	1.4	55	30	39	− 1	4	28	29	26	74	1.49	2.0	11	5,838	nw.	27	nw.	3	7	10	14	6.6	71	1890	−20	1884
Columbus	824	18	29.27	30.20	+ .05	30.8	2.8	52	23	36	− 3	4	25	21	25	82	2.34	1.2	12	4,954	sw.	25	sw.	2	2	9	20	8.0	67	1890	−20	1884
Pittsburg	842	25	29.26	30.20	+ .05	31.3	1.5	56	30	37	− 2	4	25	30	26	83	1.63	1.5	10	5,008	w.	24	nw.	3	5	10	16	7.0	75	1874	−12	•
Parkersburg	638	8	29.50	30.22	+ .07	33.3	0.5	60	23	39	4	4	27	25	26	79	1.42	1.7	13	3,581	w.	26	w.	3	2	9	20	8.0	70	1890	−11	1893
						35.2	0.5										1.94	0.8												
Lower Lake Region.						24.8	1.2	40	2	29	− 4	6	20	18	19	78	3.28	0.4	16	6,942	nw.	48	nw.	1	0	7	24	8.7	66	1874	−14	1884
Buffalo	690	26	29.38	30.16	+ .07	30.6	2.3	40	2	35	−20	6	16	25	17	84	2.04	1.0	19	9,089	se.	38	w.	3	1	4	26	8.9	64	1890	−23	1885
Oswego	335	26	29.78	30.17	+ .08	32.8	0.6	40	29	38	−10	6	18	25	18	81	3.38	0.2	22	6,113	w.	34	nw.	12	1	15	15	7.4	69	1874	−12	1873
Rochester	523	26	29.57	30.16	+ .07	28.6	0.3	46	29	32	− 2	5	21	25	21	77	1.52	2.0	15	8,019	w.	37	ne.	23	4	5	22	8.1	73	1876	−15	1875
Erie	774	24	29.36	30.17	+ .07	27.6	2.1	46	29	32	− 2	4	23	20	23	82	1.58	1.0	13	9,728	se.	44	w.	3	3	9	19	7.7	70	1874	−17	1873
Cleveland	740	26	29.34	30.18	+ .07	27.8	2.1	46	29	32	− 4	4	23	18	24	85	1.39	0.9	11	6,311	w.	31	nw.	3	5	5	21	7.5	69	1890	−16	1879
Sandusky	629	19	29.46	30.18	+ .06	27.8	2.1	48	29	32	− 4	4	23	18	23	90	1.19	1.0	9	7,309	w.	32	nw.	22	6	6	19	7.6	71	1890	−14	•
Toledo	674	26	29.42	30.18	+ .07	26.2	1.1	46	29	31	− 6	4	21	21	21	90	1.17	0.9	11	7,710	sw.	38	sw.	12	6	5	20	7.3	66	1890	−15	•
Detroit	794	26	29.35	30.17	+ .07	25.4	0.3	42	29	30	− 6	4	21	18	21	84	1.17	0.9	11	7,710	sw.	38	sw.	12	6	5	20	7.3	66	1890	−15	•
						21.2	4.2										1.62	0.5												
Upper Lake Region.						22.1	5.9	36	12	27	− 6	6	18	25	17	80	1.56	1.0	14	7,068	w.	34	nw.	3	4	6	21	8.2	59	1876	−27	1882
Alpena	609	24	29.42	30.12	+ .06	26.0	2.4	42	31	31	− 1	5	21	17	23	90	1.73	0.6	14	8,281	nw.	36	nw.	12	1	7	23	8.7	61	1890	−12	1873
Grand Haven	628	25	29.42	30.14	+ .07	19.2	4.9	36	31	24	−13	4	14	20	16	86	2.04	0.4	21	7,674	nw.	40	sw.	8	3	4	24	8.3	56	1880	−26	1881
Marquette	734	25	29.37	30.11	+ .06	24.0	2.9	40	29	28	− 5	5	20	17	19	79	0.69	1.4	12	8,035	w.	42	w.	12	4	8	19	7.0	64	1890	−15	•
Port Huron	639	22	29.44	30.17	+ .07	15.4	2.5	34	31	21	−25	5	10	25	13	88	3.97	2.2	22	6,261	se.	34	nw.	12	5	3	23	8.1	42	1892	−26	1893
Sault Ste. Marie	642	8	29.36	30.13	− .11	27.0	2.9	50	30	32	− 9	4	22	25	22	80	1.12	1.1	10	11,771	s.	44	s.	11	6	7	18	7.0	65	1876	−30	1875
Chicago	824	26	29.23	30.16	+ .05	24.6	6.0	51	29	30	−12	4	19	22	20	83	1.22	1.0	8	8,032	w.	38	w.	12	7	7	17	6.8	59	1874	−25	1875
Milwaukee	673	26	29.40	30.16	+ .06	19.0	5.5	41	29	26	−15	4	12	25	14	76	0.98	1.9	10	6,141	s.	40	w.	11	4	8	19	7.8	45	1894	−36	1888
Green Bay	617	10	29.46	30.17	+ .06	13.4	4.8	42	8	20	−25	4	7	27	10	85	1.30	0.2	13	6,386	nw.	42	nw.	2	9	10	12	6.0	51	1894	−41	1885
Duluth	702	26	29.35	30.17	+ .06	4.4	4.7										1.22	0.6												
North Dakota.						5.4	6.9	43	10	14	−37	4	− 3	35	3	85	0.74	0.0	9	8,126	n.	53	se.	21	6	5	20	7.3	46	1889	−48	1887
Moorhead	905	16	29.11	30.22	+ .05	−2.0	2.4	28	21	8	−39	4	−12	46	− 4	89	1.43	0.8	12	7,132	n.	38	nw.	2	12	10	9	4.7	48	1889	−54	1888
St. Vincent	794	16	29.27	30.22	+ .05	8.1	4.8	48	9	16	−23	4	0	44	− 2	64	0.81	0.2	7	6,928	nw.	46	nw.	1	9	7	15	6.5	50	1891	−44	1887
Bismarck	1,681	22	28.30	30.25	+ .06	6.3	4.7	43	9	14	−24	23	− 2	37	0	76	2.02	1.4	13	6,718	n.	48	w.	1	5	17	9	6.2	50	1891	−49	1888
Williston	1,875	18	28.04	30.20	+ .06	35.0	6.4										0.99	0.8												
Upper Miss. Valley.						16.8	4.9	45	10	25	−18	3	8	34	.....	.....	0.67	0.2	11	.....	nw.	.....	.....	.....	...	8	11	12	....	49	1891	−26	1893
Minneapolis	.....	7	.....	.....	.....	15.6	5.6	44	8	23	−18	3	8	31	11	83	0.81	0.2	11	5,776	se.	29	nw.	11	8	11	12	5.8	49	1879	−41	1888
St. Paul	850	26	29.21	30.20	+ .05	19.6	6.1	48	29	27	−16	4	12	30	14	83	0.67	0.6	7	4,840	s.	33	w.	11	7	10	14	6.6	59	1874	−43	1873
La Crosse	720	24	29.36	30.20	+ .07	26.6	7.5	52	11	34	− 8	3	20	29	20	79	0.89	0.8	6	6,993	ne.	36	w.	11	5	14	12	6.3	62	1894	−27	1884
Davenport	613	25	29.47	30.16	+ .01	25.0	8.3	49	30	32	− 8	4	18	28	18	74	0.60	0.8	6	5,552	n.	28	n.	2	7	10	14	6.2	64	1895	−30	1884
Des Moines	869	18	29.22	30.21	+ .03	24.3	7.8	49	•	32	−10	4	17	29	.....	.....	0.75	1.0	3	.....	w.	.....	.....	.....	7	10	14	....	62	1874	−32	1887
Dubuque	.....	23	.....	.....	.....	28.8	7.8	56	11	37	− 4	3	21	33	22	76	0.85	0.8	4	5,366	nw.	32	sw.	11	8	12	11	5.3	69	1894	−24	1894
Keokuk	613	25	29.48	30.18	+ .03	37.8	4.8	61	30	44	8	4	31	28	30	77	1.45	2.7	8	5,954	s.	34	s.	1	9	7	15	6.5	73	1890	−16	1894
Cairo	359	25	29.77	30.17	.00																									

TABLE I.—*Climatological data for Weather Bureau Stations, January, 1896*—Continued.

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Humidity and precipitation.					Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Monthly temperature data since opening station.			
			Mean pressure, 8 a.m. and 8 p.m. +2.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean minimum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					Absolute maximum.	Year.	Absolute minimum.	Year.
Up. Miss. Val.—Con																														
Springfield, Ill	644	17	29.45	30.17	.00	30.4	+ 4.8	55	31	37	— 4	3	24	31	23	77	1.77	— 0.6	7	7,045	s.	28	nw.	3	5	12	14	6.7	68	1890	—22	1884
Hannibal	534	....	29.57	30.17	.....	31.0	.....	58	29	39	1	4	24	30	23	74	1.54	.....	5	6,223	e.	37	s.	1	10	9	12	5.7	....	....	.....	....
St. Louis	571	26	29.55	30.19	+ .03	35.0	+ 6.3	62	11	42	5	3	28	30	27	76	1.43	— 0.8	7	7,837	se.	32	nw.	3	10	8	13	5.9	74	1890	—22	1884
Missouri Valley.						27.2	+ 7.4										0.67	— 0.5													
Columbia	.....	7	.....	.....	.....	33.0	+ 2.6	63	11	42	2	4	24	33	.....	.....	1.03	— 1.0	7	6,490	nw.	32	sw.	11	9	4	18	6.9	74	1894	—16	1894
Kansas City	963	8	29.12	30.20	.00	31.4	+ 5.6	55	10	38	0	3	25	31	26	80	0.79	— 0.4	8	5,808	se.	28	n.	7	10	5	16	6.3	68	1890	—17	1892
Springfield, Mo	1,394	11	28.71	30.17	+ .01	35.4	+ 5.5	64	11	43	4	3	28	29	27	75	1.50	— 0.8	7	7,291	se.	30	sw.	6	5	14	12	6.2	74	1890	—17	1894
Topeka	.....	9	.....	.....	.....	32.4	— 7.1	58	9	41	1	3	24	37	.....	.....	0.41	— 0.7	8	.....	s.	....	.....	...	5	10	16	....	70	1894	—23	1892
Omaha	1,123	26	28.94	30.20	— .02	27.3	+10.1	63	10	36	— 8	3	19	34	19	74	0.33	— 0.4	5	5,593	se.	26	nw.	22	9	7	15	6.0	63	*	—32	1894
Sioux City	1,165	7	.....	.....	.....	22.9	— 6.2	63	10	34	—10	4	11	48	.....	.....	0.21	— 0.6	3	8,362	nw.	41	nw.	11	4	9	18	7.1	63	1896	—28	1892
Pierre	1,470	21	28.52	30.19	— .01	18.5	+10.5	60	9	28	—11	3	9	43	10	73	0.62	+ 0.1	7	6,197	nw.	36	nw.	6	10	9	12	6.2	60	1896	—39	1883
Huron	1,310	15	28.70	30.20	— .01	16.8	+11.8	57	10	28	—15	3	6	40	9	75	0.45	0.0	9	9,385	se.	48	se.	19	5	9	17	6.7	57	1896	—43	1887
Northern Slope.						22.5	+ 7.0										0.55	— 0.1													
Havre	2,477	16	27.35	30.17	+ .02	7.2	+ 1.9	53	9	16	—31	3	— 2	52	4	86	1.38	+ 0.4	13	6,777	sw.	46	sw.	9	11	5	15	6.1	56	1892	—49	1886
Miles City	2,372	19	27.49	30.16	— .02	12.2	+ 1.6	51	9	23	—25	3	2	43	6	76	0.53	0.0	9	4,536	ne.	26	s.	1	9	12	10	5.5	54	1893	—45	1892
Helena	4,108	16	25.77	30.16	+ .04	23.6	+ 8.3	52	9	32	—20	15	15	55	12	64	0.72	— 0.6	9	4,632	sw.	34	sw.	19	9	10	12	5.6	59	1893	—42	1893
Rapid City	3,260	11	26.60	30.14	— .04	25.0	+ 5.8	63	27	37	—14	3	13	54	10	60	0.37	— 0.1	3	6,567	w.	48	n.	11	6	17	8	5.9	60	1892	—37	1883
Cheyenne	6,105	25	23.95	30.16	— .03	32.2	+ 8.4	58	8	43	— 4	3	21	41	13	47	0.68	+ 0.4	3	9,215	nw.	56	w.	1	7	22	2	5.0	64	1888	—38	1875
Lander	5,377	13	24.59	30.20	— .02	24.6	— 9.9	51	*	37	—20	3	12	48	14	70	0.34	— 0.5	3	2,370	sw.	50	w.	1	12	17	2	4.2	57	1892	—42	1883
North Platte	2,826	22	27.11	30.19	— .02	31.1	+13.2	63	27	44	—14	3	18	42	19	70	0.27	— 0.2	4	6,577	w.	36	nw.	9	8	17	6	4.9	70	1880	—35	1888
Middle Slope.						36.4	+ 2.8										0.46	— 0.5													
Denver	5,309	25	24.70	30.16	— .03	37.4	+10.7	67	8	52	0	3	23	42	14	44	0.25	— 0.3	4	6,393	s.	66	sw.	1	10	17	4	4.3	76	1888	—39	1875
Pueblo	4,734	8	25.25	30.14	— .02	36.8	+ 8.5	66	17	53	5	3	21	53	13	44	0.41	+ 0.1	4	4,935	nw.	47	w.	1	10	14	7	4.8	71	1892	—13	1891
Concordia	1,410	11	28.63	30.20	— .02	32.5	+11.1	64	8	43	— 3	3	22	44	20	71	0.53	— 0.5	6	4,883	s.	30	n.	2	15	4	12	4.6	72	1894	—25	1888
Dodge City	2,504	22	27.45	30.16	— .02	36.4	+12.8	68	9	48	2	3	25	48	24	74	0.49	0.0	7	7,168	se.	34	se.	29	13	7	11	5.3	73	1887	—20	1883
Wichita	1,357	8	28.68	30.17	+ .01	35.7	+ 7.7	66	9	45	4	3	27	35	27	76	0.62	— 0.9	8	6,205	n.	36	sw.	4	12	5	14	5.9	72	1894	—14	1892
Oklahoma	1,239	6	28.84	30.20	+ .02	39.4	+ 8.3	68	9	47	11	3	32	36	32	82	0.45	— 1.4	8	6,418	n.	32	n.	2	14	5	12	5.4	78	1893	—11	1892
Southern Slope.						.....	.....										.....	.....													
Abilene	1,749	11	28.29	30.18	— .02	45.4	+ 4.9	74	9	55	16	4	36	42	35	76	1.44	+ 0.5	9	6,126	n.	38	nw.	21	11	4	16	6.1	83	1890	— 5	1888
Amarillo	3,691	....	25.28	30.16	.....	39.6	.....	68	9	52	8	3	28	41	22	61	0.76	.....	5	11,311	s.	48	sw.	2	8	13	10	5.5	....	.....	.....	....
Southern Plateau.						48.2	+ 4.6										0.65	+ 0.2													
El Paso	3,767	18	26.25	30.15	+ .02	47.0	+ 3.5	73	19	61	14	1	33	41	21	45	1.63	+ 1.1	4	7,366	nw.	47	nw.	22	11	17	3	4.2	77	1890	5	1881
Santa Fe	6,998	24	23.27	30.17	.00	33.9	+ 6.1	54	27	43	11	1	25	37	16	51	0.36	— 0.1	5	4,687	ne.	26	ne.	2	17	11	3	3.7	76	1879	—13	1883
Phœnix	1,106	13	28.88	30.07	.....	54.0	+ 5.0	79	10	69	30	1	39	43	35	55	0.46	— 0.1	2	3,185	se.	20	se.	28	21	7	3	2.8	....	.....	.....	....
Yuma	141	21	29.88	30.03	— .05	57.8	+ 3.9	81	21	72	31	6	44	38	31	41	0.14	— 0.2	1	4,420	n.	28	ne.	29	17	10	4	3.3	81	1896	22	1883
Independence	3,884	....	26.06	30.09	.....	43.2	.....	63	17	55	18	1	31	35	22	47	1.67	.....	6	5,196	nw.	35	sw.	21	8	7	16	6.3	....	.....	.....	....
Middle Plateau.						36.7	+ 3.1										2.56	+ 1.0													
Carson City	4,720	9	25.29	30.12	.....	40.4	+ 9.4	60	8	51	12	4	30	41	22	50	5.26	+ 3.4	10	.....	sw.	....	.....	...	15	4	12	5.3	60	*	—22	1890
Winnemucca	4,340	18	25.66	30.14	— .06	35.6	+ 8.6	53	18	44	11	13	28	30	24	63	1.16	0.0	11	9,053	e.	54	sw.	21	4	11	16	6.9	57	1887	—28	1888
Salt Lake City	4,344	22	25.70	30.24	— .01	34.0	+ 6.3	54	27	42	9	4	26	25	25	71	1.26	— 0.3	9	4,274	se.	36	s.	17	4	8	19	7.5	54	*	—20	1883
Northern Plateau.						31.6	+ 2.4										2.00	— 0.2													
Baker City	3,430	7	26.41	30.05	— .15	30.3	+ 8.0	51	*	34	— 3	12	23	24	22	73	1.57	— 0.1	14	4,705	s.	33	sw.	17	4	9	18	7.4	51	1896	—14	1890
Idaho Falls	4,742	7	25.25	30.22	— .02	26.0	+10.5	49	28	34	—10	13	18	30	21	53	1.56	— 0.8	10	†	s.	36	s.	20	8	8	15	6.4	49	1896	—38	1883
Spokane	1,930	15	27.92	30.04	— .07	30.8	+ 9.8	52	27	36	1	3	26	20	26	81	3.00	+ 0.2	18	4,623	s.	30	sw.	18	2	5	24	8.4	55	1893	—30	1888
Walla Walla	1,018	11	28.90	30.02	— .14	39.1	+ 9.3	63	26	46	14	16	32	36	34	84	1.88	— 0.3	14	5,601	s.	33	s.	26	7	13	11	6.1	65	1888	—17	1888
N. Pac. Coast Reg.						42.3	+ 3.1										13.20	+ 3.5													
East Clallam	.....	.....	.....	.....	.....	38.9	.....	55	7	44	24	*	34	29	.....	.....	26.98	.....	26	.....	e.	....	.....	...	3	1	27	....	....	.....	....	....
Fort Canby	179	13	29.68	29.88	— .04	42.8	— 1.9	58	26	47	32	15	39	18	41	92	11.53	+ 2.5	26	16,937	s.	73	s.	25	3	3	25	8.4	60	1893	11	1888
Neah Bay	.....	13	.....	.....	.....	42.0	— 1.4	65	9	48	24	2	36	23	.....	.....	25.85	+10.5	25	.....	se.	....	.....	...	4	3	24	....	65	1896	8	1893
Port Angeles	29	11	29.81	29.84	— .13	39.0	+ 4.3	59	26	44	25	2	34	23	34	85	5.07	— 0.6	17	4,385	s.	37	w.	18	5	8	18	7.1	60	1892	— 1	1893
Port Crescent	.....	.....	.....	.....	.....	37.2	.....	56	7	43	21	2	31	23	.....	.....	10.10	.....	19	.....	sw.	....	.....	...	3	10	18	....	....	.....	....	....
Pysht §	.....	....	.....	.....	.....	37.3	.....	55	7	42	20	2	32	20	.....	.....	17.96	.....	24	.....	e.	....	.....	...	3	0	25	....	....	.....	....	....
Seattle	119	....	29.75	29.88	.....	41.8	.....	61	26	46	26	16	37	22	37	82	7.06	.....	23	5,334	s.	30	se.	20	2	6	23	8.0	....	.....	.....	....
Tatoosh Island	86	12	29.71	29.81	— .21	41.6	+ 1.4	57	7	46	27	16	37	24	38	85	22.57	+ 9.3	27	18,904	s.	60	se.	7	4	4	23	8.0	57	*	7	1893
Astoria	.....	12	.....	.....	.....	43.4	— 3.3	58	7	48	29	13	39	17	.....	.....	12.54	+ 2.0	27	.....	e.	....	.....	...	3	4	24	....	60	*	10	1888
Portland, Oreg	157	25	29.76	29.94	— .15	42.8	— 5.0	61	6	49	23	16	37	25	36	82	6.52	— 1.0	23	5,792	nw.	42	s.	5	3	12	16	6.9	62	1888	— 2	1888
Roseburg	523	19	29.36	29.94	— .19	44.4	+ 4.1	63	26	50	31	12	39	25	39	84	8.33	+ 1.7	20	2,914	se.	24	sw.	18	0	14	17	7.5	71	1888	— 6	1888
Mid. Pac. C'st Reg.						50.5	+ 3.4										2.33	+ 2.8													
Eureka	64	10	29.92	29.98	— .12	50.0	+ 4.0	66	6	56	35	30	44	25	47	88	8.14	— 1.4	21	5,397	se.	40	se.	26	3	9	19	7.4	77	1888	30	1888
Red Bluff	334	19	29.68	30.04	— .10	48.8	+ 3.5	65	6	56	30	1	42	27	42	81	7.30	+ 2.6	13	6,660	se.	42	se.	20	4	10	17	7.0	74	1891	18	1888
Sacramento	71	19	29.98	30.06	— .08	50.2	+ 4.5	62	18	57	38	4	43	27	44	81	9.76	+ 5.9	13	7,875	se.	44	se.	20	7	10	14	6.8	66	1891	19	1893
San Francisco	153	25	29.90	30.06	— .07	52.2	+ 2.2	63	20	57	40	6	48	19	48	87	8.14	+ 3.2	14	7,033	s.	47	s.	16	4	13	14	6.5	73	1887	29	1888
Point Reyes Light	.....	7	.....	.....	.....	51.2	+ 3.0	61	*	55	42	24	47	15	.....	.....	8.30	+ 2.2	14	.....	se.	....	.....	...	6	4	21	....	....	.....	....	....
S. Pac. Coast Reg.						54.6	+ 4.1										2.46	— 0.4													
Fresno	332	9	29.72	30.08	— .07	50.6	+ 6.3	67	18	60	28	5	42	31	43	78	2.89	+ 1.6	11	3,691	e.	30	nw.	29	10	6	15	5.4	69	1892	30	1888
Los Angeles	330	19	29.71	30.07	— .02	57.6	+ 4.3	87	9	68	38	6	47	39	43	71	3.23	+ 0.3	9	2,614	w.	20	nw.	29	9	14	8	4.8	87	1896	30	*
San Diego	69	25	29.98	30.06	— .04	55.5	+ 1.8	77	7	64	39	12	47	35	44	73	1.27	— 0.7	7	2,794	ne.	24	nw.	29	13	13	5	4.4	80	1893	32	1894
San Luis Obispo	201	....	29.87	30.09	.....	54.1	.....	79	10	63	30	5	45	45	43	72	8.23	.....	11	4,316	n.	25	n.	9	8	10	13	6.0	....	.....	.....	....

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.

*Two or more directions, dates, or years. †5,128 for 21½ days. §All values except precipitation for 28 days.

TABLE II.—*Meteorological record of voluntary and other cooperating observers, January, 1896.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alco†	71	18	48.6	4.65	
Ashville*†	66	13	42.7	4.42	
Bermuda†	77	16	47.4	7.36	
Birmingham	68	14	44.8	5.40	
Brewton	72	16	47.6	4.40	
Carrollton*†	62	19	44.0	4.36	
Citronelle†	68	24	49.8	3.48	
Clanton†	67	17	44.0	6.42	
Collirene*‖	70	20	46.0	7.30	
Cordova†				3.20	
Daphne†	72	19	50.8	1.77	
Decatur†	64	9	39.8	1.82	
Demopolis†				4.59	
Elba†	68	15	43.6	3.44	
Eufaula *a*†	70	21	46.2	3.47	
Eufaula *c*				3.34	
Evergreen†	70	17	46.4	4.67	
Florence *a*†				2.04	T.
Florence *b*	64	13	41.6	2.28	
Fort Deposit †	65	18	44.7	3.94	
Gadsden†	67	14	41.2	5.00	
Goodwater†	70	15	44.0	5.98	
Greensboro†	69	17	43.5	4.44	
Healing Springs†				8.71	
Highland Home†	70	17	47.2	3.68	
Jasper				2.81	
Livingston†	67	15	44.6	3.84	
Lock No. 4				4.50	
Madison Station†	62	10	41.0	1.86	
Maplegrove†				5.55	
Marion†	65	17	43.2	4.60	
Mount Willing†	74	15	47.1	5.45	
Newbern†	68	16	44.0	4.14	
Newburg†	67	10	41.8	2.61	
Newton†	74	19	45.9	6.39	
Oneonto†‖	65	11	40.8	1.84	
Opelika†				6.53	
Oxanna†	66	13	43.4	4.13	
Pineapple†	62			3.40	
Pushmataha†	70	16	46.4	4.67	
Scottsboro†	60	10	38.6	3.48	
Selma †				6.51	
Talladega*‖	70	15	44.4		
Tuscaloosa†	78	15	42.9	4.11	
Tuscumbia	63	13	40.9	2.11	
Union†	68	15	44.0	4.00	
Union Springs†	73	16	44.4	5.33	
Uniontown†	69	18	45.1	5.73	
Valleyhead†	63	10	42.4	3.95	
Warrior				4.90	
Wetumpka				6.49	
Alaska.					
Killisnoo†	42	1	17.4	7.50	56.5
Kodiak*	41	6	19.4		
Arizona.					
Benson*§	85	37	58.3	0.10	
Bisbee†	69	26	48.1	0.55	1.0
Buckeye†	85	28	57.6	0.60	
Calabasas†	72	19	46.5	0.60	
Casa Grande*§	78	30	55.1	0.65	
Dragoon†				0.35	
Dragoon Summit*§	65	29	48.0	0.39	
Dudleyville †	73	16	48.6	0.51	T.
Eagle Pass*§		18	38.2	0.46	4.6
Farley's Camp	85	31	55.9	0.97	
Flagstaff †	51	4	31.1		9.0
Fort Apache	60	14	37.6	0.16	0.3
Fort Grant†	71	34	48.6	0.29	0.2
Fort Huachuca†	70	20	48.2	0.53	
Gila Bend *a**§	79	35	56.3	1.30	
Gila Bend *b*†	82	31	58.8	0.87	
Gisela†‖	68	14	44.2	0.59	
Holbrook†	61	9	36.7	0.15	T.
Maricopa*§	90	23	47.5	0.68	
Mount Huachuca†	76	22	46.6	0.74	
Natural Bridge†				0.52	
Oracle†	69	25	49.6	1.23	1.5
Oro				0.31	
Oro Blanco	70	26	54.0	1.11	T.
Pantano*§	70	30	46.5	0.70	
Peoria†	76	29	52.4	0.85	
Phœnix	79	23	51.4	0.48	
Pinal Ranch				1.10	1.2
Reymert*†‖	75	34	49.9	2.00	
San Carlos†	69	15	45.4	0.43	
San Simon*§	75	19	48.3	0.00	
Showlow				0.50	0.5
Signal†	72	22	51.0	0.16	
Sulphur Spring Valley†				0.18	
Texas Hill*§	68	30	48.8	0.00	
Tucson *a*	77	21	50.1	0.53	
Tucson *c*†	80	28	54.5	0.53	
Walnut Ranch*†‖	68[4]	24[4]	47.0[5]	0.76	3.0
Wells	76	23	50.7	0.70	
Whipple Barracks†	70	11	39.9	0.55	4.0
Wilgus†				0.35	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Willcox*§	63	16	42.3	0.27	
Arkansas.					
Arkansas City†				2.75	
Bee Branch†‖	68	10	42.6	4.05	4.0
Blanchard Springs†	68	15	43.3	5.76	
Brinkley†	64	14	42.6	3.95	
Camden *a*†				5.39	
Camden *b*†	66	14	42.0	6.94	
Conway*‖	61	14	41.1	5.55	0.5
Corning†	62	9	39.2	2.78	0.4
Dallas†	68	11	40.8	3.01	
Dardanelle†				1.82	
Elon†	78	18	49.7	3.45	
Fayetteville†	67	7	39.7	1.64	4.0
Forrest†	65	15	42.2	5.10	
Fort Smith					1.8
Fulton†				3.70	
Gaines Landing†				2.06	
Helena *a*†				4.12	T.
Helena *b*†	65	14	40.8	4.12	
Hot Springs *a*	73	13	43.4	5.85	
Hot Springs *b*				6.12	
Hot Springs (near)				6.81	
Keesees Ferry†	69	5	39.8	2.79	2.8
Kirby†	68	11	44.5	5.75	T.
La Crosse†	62	4	36.8	3.63	3.2
Little Rock					T.
Lonoke*‖	61	17	43.0	4.31	1.0
Luna Landing*§	64	18	44.3	2.97	
Madding†			43.3	5.56	T.
Malvern†	67	14	39.8	6.32	T.
Mount Nebo†	61	6	32.0	3.90	6.5
New Gascony*‖	63[6]	16[6]	41.8[6]	5.87	T.
Newport *a*†				4.65	0.2
Newport *b*†	65	11	40.0	4.13	
Newport *c*†	66	11	40.8	4.30	1.5
Osceola†	66	12	41.0	4.09	
Ozark†	68	12	41.8	1.73	0.5
Pine Bluff†	66	13	43.0	5.66	
Pocahontas†	61	9	37.5	2.79	0.1
Rison†	66	11	41.4	6.01	
Russellville†	64	12	42.0	4.23	0.3
Silver Springs†	64	8	36.8	1.58	2.6
Stuttgart†	64	15	41.4	4.99	
Texarkana†	68	20	45.1	3.60	
Warren†	70	15	44.2	4.44	
Washington*†‖	70	15	43.6	4.86	
Wiggs				5.30	
Winslow†	60	9	35.9	1.76	4.0
Witts Springs††	62	5	37.7	1.54	1.3
California.					
Adin	51	11	35.2	3.87	6.0
Agnew	64	24	47.4	4.89	
Arlington Heights	84	34	55.6	1.45	
Athlone*§	68	30	49.7	5.14	
Azusa				2.77	
Ballast Point L. H				1.35	
Barstow†	70	20	50.0		
Bear Valley†				25.39	29.0
Berkeley	63	37	50.8	11.40	
Bishop†	63	15	37.2	1.52	
Bishop Creek*§	56	10	34.5	1.07	
Boca*§	58	— 9	32.6	7.75	1.5
Bodie†	49	— 7	34.7	5.68	50.0
Bowmans Dam†				29.85	34.0
Calloway Canal†				1.92	
Cape Mendocino L. H				14.31	
Cedarville†	48	15	35.4	3.59	1.0
Centerville*‖	68	32	54.9	7.45	
Chino*†§	76	27	52.5	2.24	
Chico*§	64	29	49.3	10.08	
Cisco*§	47	19	34.7		40.0
Claremont†	76	32	52.2	2.49	
Cloverdale*‖	62	36	53.5	23.26	
Corning*§	65	33	50.6	12.40	
Coronado	82	45	61.9	1.27	
Crafton	75	30	52.4	1.57	
Crescent City†	64	33	49.3	11.24	
Crescent City L. H				12.47	
Davisville *b*	85	30	57.2	10.79	
Delano*§	69	30	51.6	1.25	
Delta*§	66	33	47.5	31.42	
Descanso*§	79	30	54.3	2.98	
Drytown	65	30	49.6	9.11	
Dunnigan*§	68	25	52.3	15.13	
Durham*‖	60	29	46.1	9.92	
East Brother L. H				6.15	
Echo Mountain				2.85	
Edgwood*§	53	30	39.6	6.64	
Edmanton*†‖	52	23	36.5	32.70	14.0
Escondido	88	26	53.5		
Evergreen				5.25	
Fallbrook*‖	85	33	51.5	3.45	
Folsom City *b*‖	66	31	50.6	9.11	
Fordyce Dam				25.05	116.0
Fort Bragg†	70	31	51.9	10.62	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fort Ross				24.04	
Fort Tejon				3.07	
Georgetown†	66	30	46.6	19.55	
Glendora				4.05	
Goshen*§	68	36	50.0	1.08	
Grass Valley				20.34	T.
Greenville†	54	12	36.8	16.66	4.0
Guinda				13.27	
Healdsburg*‖	62	28	48.4	23.01	
Hollister	68	25	51.0	6.76	
Hueneme				5.14	
Humboldt L. H				7.83	
Hydesville †	66	32	50.7	9.99	
Indio*§	80	29	55.3		
Iowa Hill*‖	64	33	46.7	17.77	
Iron Mountain				30.56	
Jackson	58	31	44.4	8.79	
Jolon				8.14	
Julian†	71	31	47.0	4.55	1.5
Keeler*§	60	29	44.9	0.45	
Keene*§	70	34	49.9	2.82	
Kennedy Gold Mine	64	28	47.6	11.80	
Kernville				3.52	
King City*§	68	24	52.1	4.53	
Kingsburg*§	68	25	49.0	2.14	
Kono Tayee	57	34	46.6	9.42	
Lagrange*§	65	30	51.3	4.72	
La Porte*†‖	51	22	36.2	32.43	87.0
Lemoore*§	70	22	49.7	1.85	
Lick Observatory†	65	27	45.2	9.54	
Lime Kiln	72	27	51.6		
Lime Point L. H				8.18	
Lodi	64	28	49.7	9.02	
Los Alamos†				3.89	
Los Gatos *b*	62	35	50.2	17.39	
McMullin*‖	70	30	49.2		
Malakoff Mine*‖	64	32	44.5	24.11	
Mammoth Tank*§	80	31	56.4	T.	
Manzana	62	21	44.2	1.09	
Mare Island L. H				7.91	
Merced*§	64	29	53.3	5.50	
Middletown*†‖	66	34	46.2	25.78	
Mills College				11.90	
Milton (near)*‖	65	33	54.0	9.30	
Modesto*§	70	27	52.1	4.56	
Mohave*§	65	25	48.5	1.31	
Mokelumne Hill*§		35	44.8	9.41	
Monterey*§	66	30	52.7	3.24	
Mountain Home				11.41	9.5
Mount Frazier†				2.94	
Mount Glenwood*‖	63	33	50.4	24.22	
Napa *b*	65	33	52.6	9.28	
Needles†	70	30	47.0	0.00	
Nevada City†	63	27	44.2	19.61	
Newcastle *a*†	60	32	47.4	10.06	
Newhall*§	79	25	51.8	2.15	
Nordhoff†	87	27	52.4	5.78	
Oakland *a*	64	33	51.0	11.08	
Ogilby*§	78	38	55.6	0.00	
Oleta*‖	62	31	46.3	9.94	
Orange	80	31	54.6	2.85	
Orangevale†	64	31	49.8	10.42	
Orland*§	65	27	47.5	8.54	
Ormonde†				25.53	
Oroville *b*	63	34	52.3	11.41	
Palermo†	64	30	46.9	10.03	
Paso Robles *b*	62	21	46.6	4.64	
Peachland				17.55	
Picacho	84	40	60.2	0.25	
Piedmont				11.30	
Piedras Blancas L. H				7.79	
Pigeon Point L. H				7.84	
Pilot Creek				25.47	11.0
Placerville *b*	60	21	44.3	16.38	
Point Ano Nuevo L. H				3.65	
Point Arena L. H				11.76	
Point Bonita L. H				12.65	
Point Conception L. H				6.11	
Point Fermin L. H				3.50	
Point George L. H				4.54	
Point Hueneme L. H				5.56	
Point Lobos	59	41	51.2	7.33	
Point Loma L. H				0.45	
Point Montara L. H				10.24	
Point Pinos L. H				5.62	
Point Reyes L. H				8.30	
Point Sur L. H				7.62	
Pomona (near)	83	32	54.6	2.42	
Portersville*§	70	31	55.3	1.61	
Poway				2.50	
Quincy†	54	16	37.8	20.79	1.0
Ravenna*§	72	32	51.6	0.80	
Redding *b*†	67	29	48.2	14.52	
Reedley (near)*‖	70	30	51.1	4.10	
Represa	64	30	51.2	9.07	
Rio Vista	67	25	48.0	9.01	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Riverside†	84	30	54.6	1.69	
Roe Island L. H.				6.80	
Rosewood	65	24	46.4	13.60	
Sacramento *a*	66	28	49.8	10.46	
Salton*§	112	30	63.6	T.	
San Bernardino†	82	29	54.2	2.02	
San Jacinto	85	24	52.3	2.04	
San Jose *b*	68	34	49.6	5.17	
San Leandro*‡	74	37	55.4	9.84	
San Luis L. H				6.32	
San Luis Obispo *a*				7.87	
San Mateo*§	66	38	53.6	8.80	
San Miguel*§	63	19	49.7	3.57	
San Miguel Island†	75	40	55.2	5.37	
San Rafael†				20.07	
Santa Ana*§	78	42	63.2	3.43	
Santa Barbara L. H.				6.49	
Santa Clara *a*§	68	30	50.9	6.02	
Santa Cruz *b*†	75	31	53.0	8.52	
Santa Cruz L. H.				7.91	
Santa Maria	75	32	56.0	4.60	
Santa Monica*§	69	41	58.5	3.75	
Santa Paula *b*†	82	35	55.1	5.66	
Santa Rosa*§	62	25	47.6	10.57	
Saticoy				5.53	
Shasta				27.67	
Shasta Springs†	54	18	37.7	13.25	2.0
S. E. Farallone L. H				7.17	
Stanford University	66	31	51.0	6.96	
Stockton *a*	67	26	49.2	6.09	
Summerdale*†§	62	23	40.5	21.56	4.0
Susanville†	53	21	38.0	6.94	2.0
Sutter Creek*§	58	24	42.8	7.28	
Tecarte Dam*‡	83	20	41.6	2.04	
Tehama*§	68	32	52.2	11.15	
Tejon Ranch				1.90	
Templeton*§	68	30	48.6	4.99	
Trinidad L. H.				8.46	
Truckee*§	44	0	27.4	7.07	16.5
Tulare *b*				2.19	
Tulare *c*	74	34	52.0	1.78	
Turlock *b*†	69	32	49.1	3.96	
Ukiah†	62	26	47.5	16.68	
Upper Lake	64	26	46.3	11.18	
Upper Mattole*‡	60	36	52.8	26.22	
Vacaville *a*‡	62	30	50.4	14.46	
Ventura†	80	37	55.9	5.13	
Volcano Springs*§	83	31	57.3	0.00	
Walnut Creek	66	28	50.8	11.05	
Washington*‡	63	20	44.2	24.12	
West Point†				12.90	
Wheatland	61	27	47.5	8.54	
Williams*§	68	28	50.1	7.47	
Willows *b*§	65	28	50.7	9.96	
Wilmington*§	74	36	60.8		
Wire Bridge*§	60	26	48.2	11.40	
Yerba Buena L. H				8.78	
Yreka†	57	12	37.0	7.37	
Yuba City*§	64	35	52.1	10.07	
Engineers Quarters‡				2.38	4.0
Morses House‡				5.95	8.8
Grass Valley‡				4.19	5.4
Deep Creek‡				1.86	5.5
Holcomb Creek‡				1.56	7.0
Squirrel Inn‡				4.51	3.5
Green Valley‡				2.92	14.0
Tunnel No. 2‡				1.17	4.3
Colorado.					
Alma†	47	— 7	22.8	0.51	3.0
Antlers†	49	— 7	25.8	0.60	7.0
Arkins				0.62	7.5
Boxelder				0.53	5.0
Breckenridge†	72	—12	25.6	1.88	18.8
Byers*‡	65	10	38.2		
Canyon†	65	4	35.9	0.14	2.0
Castlerock†	62	— 6	32.5	0.65	6.5
Climax†	40	— 4	17.6	4.50	45.0
Collbran				0.51	4.8
Colorado Springs†	64	— 3	35.0	0.13	2.5
Cope†	67	— 6	36.4	0.69	1.1
Crook	75			0.07	0.5
Deertrail*§	64	— 5	38.2		2.0
Delta†	55	— 2	29.2	0.65	
Denver					3.8
Divide Exper. Station	61	— 5	30.8	0.58	6.5
Downing	75	10	40.2	0.08	
Dumont*†§	58	10	36.2	0.25	2.5
Durango†	52	0	32.4	0.50	5.0
First View*§	60	0	39.7		
Fleming				0.59	1.3
Fort Collins†	68	— 8	32.6	0.43	3.8
Fox				0.40	1.0
Garnett				0.12	1.2
Gleneyrie†	58	9	34.9	0.41	5.5
Goldhill*‡	65	5	35.6	0.90	9.0
Grand Junction†	55	4	33.4	0.37	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Colorado—Cont'd.	°	°	°	*Ins.*	*Ins.*
Greeley†	58			0.67	6.5
Gulch†	44	8	26.9	0.60	14.0
Gunnison†	48	—24	8.8	1.21	12.1
Holly				0.52	1.0
Holyoke *a*				0.47	0.2
Holyoke *b*				0.45	
Hugo*†§	60	8	32.8	0.17	1.0
Hugo (near)†	62	— 4	31.7	0.52	0.2
Husted†	70	—10	35.1	0.43	3.7
Jamestown	57	— 4	31.2	0.76	8.0
Julesburg†	64	—21	29.1	0.39	T.
Kit Carson*‡	62	6	33.9		
Lake Moraine†	47	1	27.0	0.80	10.5
Laporte				0.60	1.0
Las Animas†	64	2	35.0	0.25	
Lay*†‡	45	—10	21.0	0.95	9.5
Leadville (near)*†‡	46	— 7	21.2	1.26	22.0
Lerroy†	59	— 9	33.4	0.53	0.9
Longmont†	65	— 5	32.0	0.38	3.8
Loveland				0.35	3.5
Meeker†	50	—18	22.0	1.24	11.9
Millbrook†	61	— 8	30.0	0.36	7.2
Minneapolis†	68	2	38.4	0.66	
Monte Vista	44	—12	21.9	0.05	1.0
Montrose†	58	— 1	31.2	0.84	
Moraine†	58	7	31.7	0.53	6.5
Ouray†	47	9	28.8	1.70	17.0
Pagoda	50	—16	22.4	1.70	17.0
Paonia†				1.13	
Parachute†	46	— 8	23.2	0.38	1.0
Pueblo					0.5
Rangely†	64	—30	14.8	0.50	5.0
Redcliff				1.30	13.0
Rico†	48	— 3	26.1	2.40	24.0
Riverbend*§	70	2	35.8		1.0
Rockyford†	67	4	35.1	0.32	
Ruby†				7.69	77.0
Saguache†	45	— 4	22.8	0.25	2.5
St. Cloud†				0.20	2.0
San Luis†	57	—17	22.4	0.11	1.2
Santa Clara*†‡	52	0	30.8	1.40	14.0
Seibert†				0.85	3.0
Smoky Hill Mine†	65	— 1	35.0	1.10	11.0
Stamford*‡	52	6	26.6	1.40	14.0
Sulphur Springs	41	—10	18.2	1.95	19.5
Surface Creek†	50	4	30.3	1.12	3.0
Thon†	68	1	36.6	0.17	2.5
T. S. Ranch†	59	5	32.3	0.50	
Twin Lakes				4.80	48.0
Vilas				0.58	T.
Wallet†				0.82	2.0
Watkins*‡	58	— 2	30.9		T.
Wray†	66	—15	32.8	0.47	1.0
Yuma				0.60	2.0
Connecticut.					
Bridgeport	43	— 4	25.3	1.82	7.5
Canton†	44	—14	30.9	1.93	9.0
Colchester	48	— 9	23.4	1.84	8.0
Falls Village				1.11	11.2
Greenfield Hill				2.12	6.5
Hartford *b*				1.61	9.0
Hartford *c*	44	— 7	24.4		
Lake Konomoc				1.02	
Middletown	46	— 8	23.9	1.80	11.0
New Haven					7.6
New London†	44	— 2	26.0	0.50	6.0
North Grosvenor Dale	39	—14	19.6	2.56	10.2
Norwalk	46	— 7	23.6	1.35	5.5
Southington*‡	39	— 8	22.8	1.60	7.0
South Manchester				0.67	8.0
Storrs	40	—13	21.4	1.60	8.5
Thompson*‡	38	—14	20.6		
Voluntown†	45	— 9	24.2	2.10	7.0
Wallingford†				1.72	7.0
Waterbury	39	— 9	24.0	2.37	12.0
West Simsbury				1.75	11.0
Windsor	43	— 8	21.8	0.98	9.9
Delaware.					
Dover†	56	9	32.3	1.57	
Milford	65	9	33.2	2.05	
Millsboro	63	6	32.2	1.61	0.2
Newark	54	4	29.8	1.30	1.5
Seaford†	61	6	33.0	1.06	T.
Wilmington†	55	8	31.9	2.50	1.6
District of Columbia.					
Dist'ing Reservoir*§	56	10	33.0	1.89	
Receiving Reservoir*§	56	9	32.7	1.94	
Washington					0.2
West Washington	65	8	34.0	1.77	T.
Florida.					
Amelia†	69	36	51.2	2.85	
Archer†	78	24	54.5	4.20	
Avonpark†	79	35	59.6	3.38	
Bartow†	75	30	55.6	2.52	
Brooksville†	75	30	55.0	4.31	
Clermont†	79	34	57.3	4.77	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Florida—Cont'd.	°	°	°	*Ins.*	*Ins.*
Eustis†	78	29	56.5	7.27	
Federal Point†	75	29	53.6	4.08	
Fort Meade†	75	25	54.8	3.26	
Frostproof*†‡	77	34	57.8	2.02	
Grasmere†	81	30	56.0	4.29	
Hypoluxo*†‡	82	41	64.7	2.30	
Kissimmee†	78	32	60.5	4.79	
Lake City†	75	27	55.0	2.59	
Lemon City†	80	40	63.5	0.45	
Manatee†	80	27	55.0	2.23	
Merritts Island†	76	39	59.5	5.87	
Milton†				6.90	
Mullet Key†	68	36	56.9	2.34	
Myers†‡	78*	38	59.5	2.53	
New Smyrna†	75	33	54.3	8.01	
Oakhill*‡	75	40	59.2		
Ocala*†‡	77	29	54.0	4.58	
Orange City†	76	29	56.1	6.56	
Orangepark	72	24	52.4	2.67	
Orlando†	80	33	58.5	5.08	
Plant City†	81	29	57.1	3.37	
St. Francis†	81	33	57.4	6.10	
St. Francis Barracks	72	29	52.6	4.40	
Tallahassee†	74	22	50.7	5.41	
Tarpon Springs†	78	28	54.6	4.58	
Georgia.					
Adairsville†	64	11	39.8	3.64	
Albany†	68	17	46.8	3.66	
Americus†	71	14	45.4	4.45	
Blakely*†§	70	18	48.1	4.15	
Brag	80	14	47.5	3.35	
Canton†				4.44	
Clayton†	62	12	38.3	5.20	
Columbus				4.47	
Covington	69	11	41.6	4.59	
Dahlonega†	66	9	40.8	4.57	
Diamond†	65	5	38.4	3.32	
Dublin *b*†				3.98	
Elberton	70	13	43.3	5.45	
Fleming†	71	15	46.9	3.75	
Forsyth*‡	70	19	48.5	3.88	
Fort Gaines†	67	18	45.6	3.95	
Gillsville†	67°	12°	40.7°	4.45	
Hephzibah*§	66	22	46.3	4.30	
Lagrange†	67	14	43.7	4.98	
Louisville†	70	14	42.8	3.31	
Lumpkin	72	19	47.4	3.61	
Macon†				3.58	
Marietta†	68	12	40.6	4.01	
Marshallville†	70	18	46.8	5.25	
Milledgeville†	72	16	43.8	3.94	
Millen†	74	16	45.0	3.05	
Monticello*†‡	68	19	45.8		
Morgan†	71	15	47.4	4.01	
Point Peter*‡	60	16	42.1	5.40	
Poulan†	75	15	47.8	2.97	
Quitman	71	18	48.6	3.93	
Ramsey†	66	9	42.0	2.77	
Resaca†				3.35	
Rome†	68	14	41.2	4.06	
Talbotton†	70	18	44.7	5.40	
Thomasville†	72	30	49.8	4.05	
Toccoa†				4.60	
Washington†	68°	15°	41.6°	3.85	
Whitesburg†				6.47	
Idaho.					
American Falls†	50	—10	27.6	2.32	
Atlanta†	45	2	25.7	7.79	97.0
Blackfoot†	54	— 4	27.8	1.35	T.
Bliss†	50	0	28.8	3.68	
Boise Barracks†	57	4	33.2	3.72	6.0
Carriboo	45	6	26.9	3.51	36.0
Challis	48	— 5	27.6	0.81	3.5
Chesterfield†	44	—21	19.8	1.30	1.0
Cœur d'Alene	52	— 1	30.6		
Corral*†‡	41	—20	20.4	4.35	41.0
Dairy†	51	4	33.3	2.38	
Downey†	50	—10	26.3	2.00	1.1
Fort Lemhi†	51	—11	26.4	0.46	4.5
Fort Sherman†	51	— 5	28.8	4.14	18.9
Fraser†				1.80	12.0
Grangeville	55	9	33.6	2.77	3.0
Idaho City†	50	— 8	26.5		30.5
Idaho Falls					2.1
Junction† *b*	46	—25	10.2	0.07	0.7
Kootenai†	50	— 6	23.6	4.07	32.0
Lake†	34	—14	17.6	3.00	30.0
Lewiston†	62	12	38.0	1.36	4.2
Lost River†				2.91	27.6
Martin†	48	—14	20.4	3.35	8.5
Minidoka†	50	—10	27.6	1.94	4.2
Moscow†	48	20	36.1	1.73	
Murray†	46	— 4	26.5	5.67	39.0
Nampa	55	8	33.2	2.01	8.2
Oakley†	55	6	34.7	1.19	5.0
Orchard	61	5	33.1	1.88	2.8

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Idaho—Cont'd.	°	°	°	*Ins.*	*Ins.*
Paris†	46	−10	22.8	1.71	.....
Payette†	60	− 2	33.6	2.58	8.2
Roseberry	48	1	24.8	2.81	8.0
Salubria†	51	−16	27.3	6.40	14.4
Soldier†	38	−20	18.4	7.85	58.2
Swan Valley†	57	−11	22.8	1.23	4.0
Warren†	56	−21	28.2	4.88	.....
Illinois.					
Albion†	57	2	33.6	0.73	
Alexander†	55	− 2	31.0	1.19	0.2
Altamont *5	52	− 3	31.0	1.00	T.
Ashton *†	47	−15	33.2	0.57	2.1
Atlanta	.....	.....	.....	1.35	0.5
Atwood *a *†	.....	−10	27.1	1.53	1.0
Atwood *b*	.....	.....	.....	1.17	.....
Aurora *a*	62	− 8	29.2	0.91	.....
Aurora *b*†	51	−10	25.9	1.21	1.7
Beardstown†	.....	.....	.....	1.65	T.
Bloomington†	.....	− 7	.....	0.82	1.0
Bushnell†	55	− 4	29.6	1.00	2.0
Cairo	.....	.....	.....	.....	0.2
Cambridge	50	− 6	28.0	0.92	
Carlinville†	55	2	31.5	1.28	
Carlyle	.....	.....	.....	1.39	.....
Carrollton	54	0	30.4	1.41	T.
Catlin†	52	− 9	28.8	1.06	0.2
Cazenovia *†	48	− 7	27.2	1.55	1.0
Charleston *1	54	− 2	30.9	1.02	0.3
Chemung *1	49	−13	24.3	0.99	6.2
Chester†	.....	.....	.....	1.79	1.0
Chicago	.....	.....	.....	.....	2.0
Cisne†	59	6	35.9	1.15	
Clear Creek†	50	− 8	27.4	0.92	0.8
Coatsburg†	55	− 3	28.4	1.00	3.5
Cordova†	.....	.....	.....	0.93	T.
Decatur†	53	− 3	30.2	0.97	1.0
Dixon†	51	− 8	25.8	0.65	2.0
Duquoin *1	59	6	35.8	1.51	T.
East Peoria†	53	− 5	28.7	0.75	T.
Evanston *10	48	−12	26.0	.....	.....
Fort Sheridan†	49	− 9	25.0	0.56	1.6
Frederick *5	52	− 3	29.2	1.40	1.0
Friend Grove *†	.....	4	34.2	0.94	T.
Galva†	48	− 9	26.6	1.17	0.2
Gilman†	54	− 9	28.3	1.30	1.0
Glenwood *†	46	−14	25.1	0.94	1.0
Golconda†	57	9	38.0	1.63	.....
Grafton†	.....	.....	.....	1.45	.....
Greenville†	59	2	32.6	3.54	T.
Griggsville†	54	− 1	31.8	1.50	.....
Halliday *5	60d	8d	37.2d	1.99	T.
Havana†	55	0	31.6	1.21	0.5
Herrins Prairie *1	60	10	35.8	1.00	
Hillsboro *†	58	2	33.5	0.73	
Iron†	59	8	36.3	1.35	.....
Joliet†	57	− 5	29.8	1.14	0.6
Jordans Grove†	59	6	37.0	1.33	0.2
Kankakee *a*	50d	0d	28.6d	1.09	.....
Kankakee *b* *	50	− 7	29.6	.....	.....
Knoxville *5	51	− 6	28.6	1.15	1.5
Lagrange†	51	− 8	26.2	1.16	T.
La Harpe *1	50	− 6	27.9	1.26	2.0
Lanark *†	46	− 9	24.7	0.49	2.0
Lexington†	52	− 7	27.0	1.09	0.6
Loami	.....	.....	.....	0.76	T.
Louisville†	56	3	33.6	1.05	T.
McLeansboro *†	.....	6	33.0	1.47	T.
Martinsville†	53	2	30.6	0.85	.....
Mascoutah *5	57	2	35.0	1.54	0.4
Mattoon *1	57	5	34.6	0.80	0.1
Minonk *†	49	− 8	27.8	1.26	0.5
Monmouth†	53	− 7	27.5	1.10	1.8
Morrisonville†	57	0	30.8	0.43	
Mount Carmel†	.....	.....	.....	0.94	.....
Mount Pulaski	55	− 2	29.6	1.32	1.5
Mount Vernon	61	6	37.8	1.77	0.2
New Burnside†	59	4	35.3	1.33	T.
Olney *a* *1	57	2	34.8	0.89	T.
Olney *b* *1	55	0	30.1	1.22	T.
Oregon	48	4	26.2	.....	.....
Oswego *1	49	−12	25.1	1.09	T.
Ottawa†	53	− 8	26.0	1.37	0.8
Palestine†	55	2	32.5	1.00	T.
Peoria *a*†	.....	.....	.....	1.34	.....
Peoria *b*	54	− 4	30.7	1.30	1.0
Philo†	58	− 8	28.2	1.06	0.5
Plumhill†	.....	.....	.....	0.99	.....
Rantoul *†	53	− 7	28.3	0.86	0.8
Reynolds	53	− 8	26.4	0.92	5.3
Riley†	49	−12	24.2	0.61	1.9
Robinson *1	52	0	31.2	1.00	T.
Rockford†	48	−10	25.6	0.90	5.5
Rose Hill *†	50	4	32.2	1.65	0.5
Rushville	55	− 3	29.0	1.56	0.6
St. Charles *†	46	−10	28.2	1.05	1.5
St. John *1	56	5	34.9	1.58	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Scales Mound†	48	−10	25.2	0.77	5.8
Springfield	.....	.....	.....	.....	0.5
Streator†	51	− 8	28.2	1.30	2.5
Sycamore *†	48	−10	26.0	0.50	0.5
Tiskilwa *2	48	− 8	25.8	1.16	1.0
Tuscola *†	55	− 5	30.9	0.91	0.5
Walnut *†	53	− 9	27.4	0.87	1.4
Wheaton *3	.....	− 8	24.2	1.09	2.0
Winnebago†	47	−10	25.4	0.65	4.0
Zion†	50	−13	24.5	1.02	2.2
Indiana.					
Anderson†	56	−10	28.6	1.47	2.0
Angola *1	50	−10	26.0	2.37	3.8
Bedford†	56	0	32.8	1.10	.....
Bluffton†	55	−12	26.4	1.31	1.0
Butlerville†	58	− 2	32.2	1.00	T.
Cambridge City†	50	− 8	28.5	1.84	0.7
Columbia City *1	48	−12	25.7	1.60	1.9
Columbus†	56	− 5	30.1	1.17	0.5
Connersville†	53	− 6	29.7	1.37	1.0
Delphi	51	−11	26.7	0.79	1.0
Edwardsville *†	60	2	35.4	1.31	T.
Evansville†	60	5	33.8	0.57	T.
Farmland†	54	− 6	29.5	1.36	1.5
Franklin *1	55	− 4	30.6	1.70	0.5
Greencastle†	53	− 4	28.8	0.86	0.4
Hammond†	51	− 9	23.3	2.68	0.4
Huntingburg	59	3	34.0	0.90	4.0
Huntington	53	−10	26.4	1.73	2.0
Indianapolis	.....	.....	.....	.....	1.1
Jasper†	57	4	34.8	0.70	.....
Jeffersonville	58	3	36.1	0.90	T.
Kokomo†	53	− 8	28.2	0.99	1.6
Laconia	58	2	34.6	1.65	T.
Lafayette†	56	−12	28.0	0.83	0.7
Logansport *b*	56	− 7	29.0	1.02	
Lyford†	53	− 2	30.4	0.79	0.2
Madison†	57	1	34.6	1.44	0.5
Marengo *†	56	3	34.4	2.30	T.
Marion†	52	−12	28.8	1.59	1.2
Mauzy†	52	− 8	28.6	1.49	1.0
Mount Vernon†	56	6	33.9	1.06	
Princeton *†	58	2	34.8	1.19	0.5
Rockville†	55	− 5	29.2	0.85	0.5
Rushville	.....	.....	.....	1.37	0.1
Scottsburg *†	55	1	33.3	0.81	T.
Seymour†	56	0	30.6	0.92	
South Bend†	52	−10	26.4	1.04	1.5
Sunman	52	− 6	29.1	1.30	0.5
Syracuse†	.....	.....	.....	1.35	1.9
Terre Haute†	58	0	32.6	0.75	T.
Tipton†	67	−14	28.6	0.90	1.4
Valparaiso†	50	−12	24.7	1.15	2.5
Vevay	53	0	34.4	1.45	
Vincennes†	57	2	31.7	0.55	
Worthington†	55	0	31.4	1.08	0.4
Indian Territory.					
Eufaula†	.....	.....	.....	0.25	1.0
Healdton†	70	6	43.0	2.15	
Kemp†	69	11	42.9	2.54	
Lehigh†	70	8	42.2	1.32	
Purcell	70	2	38.3	1.45	
South McAlester†	56	20	40.0	1.15	1.5
Tahlequah†	78	8	40.8	1.64	0.4
Tulsa†	.....	.....	.....	0.50	
Vinita†	60	10	39.4	0.56	
Iowa.					
Afton	49	−10	25.6	0.50	2.5
Algona *1	52	−13	20.6	0.16	0.8
Alta†	54	−14	21.0	0.42	0.2
Amana†	50	−10	23.2	0.52	2.0
Ames *c*	.....	.....	.....	0.44	2.5
Atlantic†	57	− 8	24.8	0.56	0.8
Audubon	56	−12	25.2	0.41	2.0
Belknap	50	− 6	24.9	0.90	5.5
Belle Plaine	50	−15	22.0	0.63	4.0
Bonaparte†	56	− 5	27.0	1.38	8.0
Carroll	57	−12	22.8	0.55	0.5
Cedarfalls†	49	−14	22.0	0.50	4.0
Cedar Rapids†	51	−10	25.0	0.27	4.0
Chariton *1	50	− 8	27.5	0.62	6.2
Charles City†	44	−16	20.0	0.60	3.2
Clarinda†	48	−10	24.0	0.55	2.5
Clinton	50	−10	25.2	1.16	4.5
College Springs	51	− 8	27.2	0.42	.....
Corning†	52	− 8	26.5	0.57	2.0
Cresco†	43	−20	16.7	0.49	3.5
Davenport	.....	.....	.....	.....	4.4
Decorah†	43	−18	18.4	0.65	4.5
Delaware *3	47	−14	19.9	0.69	6.0
Denison†	60	−11	23.0	T.	T.
Des Moines	.....	.....	.....	.....	3.1
Dows	49	−16	20.7	0.34	1.5
Dubuque	.....	.....	.....	.....	5.0
Elkader†	52	−14	20.8	0.73	4.5
Emmetsburg	57	−14	18.9	0.12	T.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Estherville	53	−14	20.6	0.40	T.
Fairfield†	53	− 7	26.0	0.63	4.2
Fayette†	47	−15	20.2	0.70	5.5
Forest City	49	−15	17.2	.....	0.5
Fort Madison *†	53	0	30.7	1.25	4.5
Galva	.....	−12	.....	0.33	T.
Gardengrove	50	−11	23.6	0.57	3.0
Glenwood†	.....	.....	.....	0.55	2.5
Grand Meadow *1	44	−14	19.5	0.60	5.5
Greenfield†	49	−12	25.6	0.76	3.8
Grinnell†	47	− 9	23.9	0.08	T.
Grundy Center	47	−16	20.8	0.22	1.0
Guthrie Center *2	53	−11	27.6	0.10	.....
Hampton	48	−15	18.6	0.32	1.0
Hawkeye	.....	.....	.....	1.00	7.5
Hopeville†	50	−10	25.4	0.61	4.0
Humboldt†	53	−12	21.8	0.27	2.0
Independence†	46	−15	20.4	0.56	4.6
Indianola†	51	−12	25.4	0.22	0.8
Iowa City *a*†	52	−11	25.7	0.70	4.5
Iowa City *b*	54	−10	25.4	.....	.....
Iowa Falls†	46	−19	19.6	0.34	0.7
Keokuk	.....	.....	.....	.....	2.7
Keosauqua†	55	− 4	28.0	0.30	6.5
Knoxville	51	−10	25.2	0.30	0.5
Larrabee†	56	−14	22.5	0.28	0.4
Le Claire†	.....	.....	.....	0.91	.....
Lenox *1	51	− 7	26.3	0.75	3.1
Logan†	50	− 9	23.1	0.64	.....
Madrid	50	−17	21.8	0.35	1.0
Malvern *1	60	−12	25.0	0.45	5.0
Marshall†	51	−13	21.6	0.15	.....
Mason City†	47	.....	.....	0.33	1.5
Maxon *1	52	− 8	26.4	0.45	4.5
Mechanicsville	51	−10	23.9	0.72	5.5
Monticello *†	43	−17	19.9	0.42	3.0
Mount Ayr†	55	−10	26.4	0.65	3.0
Mount Pleasant *1	47	− 7	28.1	0.77	4.0
Mount Vernon *1	51	−15	23.9	.....	.....
Neola	68	−14	25.4	0.18	0.4
Newton†	49	−10	24.0	0.46	2.2
Ogden	54	−15	23.9	0.21	1.4
Osage *3	.....	−16	17.8	0.34	2.8
Oskaloosa†	52	−10	24.8	0.30	1.8
Ottumwa	58	− 7	27.1	1.15	8.0
Ovid†	51	− 8	25.6	0.87	4.0
Panama†	.....	−12	21.2	0.10	0.7
Portsmouth	65	− 9	27.2	0.05	0.6
Primghar	54	−14	22.0	0.25	0.2
Rock Rapids	54	−18	22.6	T.	T.
Sac City†	58	−12	22.5	0.78	0.3
Seymour†	52	− 8	25.8	2.10	8.0
Sibley	.....	−13	.....	0.35	1.0
Sidney	59	− 8	25.8	0.78	6.2
Sioux City	.....	.....	.....	.....	0.4
Spencer *j*	59	− 5	23.8	0.22	T.
Spirit Lake†	54	−14	19.0	0.08	T.
Toledo	50	−12	21.1	0.25	2.0
Villisca†	52	− 9	24.3	0.49	2.8
Vinton *1	48	−10	23.4	0.60	4.0
Washington†	55	− 9	25.2	0.74	4.0
Waterloo	48	−14	20.6	0.51	3.2
Waukee	58	− 9	27.6	0.25	.....
Waverly *2	.....	.....	18.8	0.43	.....
Westbend *†	53	−11	19.9	0.25	1.0
Wilton Junction†	51	− 8	26.0	0.75	5.0
Winterset†	50	−13	22.9	0.60	6.0
Kansas.					
Abilene†	62	0	32.0	1.33	2.0
Achilles *6	65e	−10	33.9	0.39	0.2
Altoona *†	59	6	34.6	0.48	2.0
Atchison†	61	− 3	30.2	0.86	8.0
Augusta	64	4	35.4	0.50	.....
Baker	60	− 4	30.0	0.57	4.2
Beloit†	62	− 3	30.6	0.67	1.8
Blaine	58	− 7	30.4	0.59	6.2
Burlington†	60	2	32.2	0.45	1.8
Campbell	60	− 5	30.0	0.44	2.9
Colby†	63	−10	34.2	0.46	T.
Coldwater†	70	1	36.2	1.45	1.0
Collyer *5	64	− 6	37.7	0.25	
Columbus†	59	5	34.2	0.63	2.5
Concordia	.....	.....	.....	.....	1.6
Coolidge†	65	0	34.1	0.90	1.0
Cunningham†	68	2	34.4	0.71	3.5
Dodge City	.....	.....	.....	.....	T.
Downs	.....	.....	.....	0.91	.....
Dresden *†	62	− 8	32.7	1.05	T.
Eldorado†	60	2	34.2	0.60	1.0
Elk City *1	60	8	36.6	0.37	0.2
Ellinwood *3	62	1	30.8	0.61	
Emporia†	60	2	34.5	0.30	3.0
Englewood†	72	4	37.5	0.57	
Eureka†	.....	.....	.....	0.49	
Eureka Ranch†	63	− 7	33.8	0.68	
Fort Riley†	62	0h	33.6d	0.26	0.5

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Kansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fort Scott				0.60	T.
Frankfort	66	— 4	33.0	0.73	4.0
Garden City	65	— 8	35.2	0.44	T.
Garfield				0.33	T.
Girard *1	58	3	33.7	0.41	2.0
Goodland †	77	—11	35.0	0.35	T.
Gove *†	69	— 3	34.0	0.78	
Grainfield *6	72	0	41.8	T.	T.
Greensburg †	68	1	36.6	1.01	T.
Grenola *1	64	5	35.4	0.35	T.
Halstead	62	— 2	32.8	0.48	0.5
Hays †	68	—11	32.4	0.50	
Horton †	56	— 2	30.4	0.73	6.0
Hutchinson †	74	0	38.2	0.72	1.5
Independence †	61	6	35.3	0.43	1.2
Jaqua †	63	— 3	33.1	0.39	1.0
Lawrence [1]		2	31.8	0.90	5.0
Lebo †	62	2	32.8	0.72	3.2
Lyons	95	— 2	34.5	0.57	0.4
Macksville †	63	1	33.9	0.90	T.
McPherson †	68	0	33.9	0.59	
Manhattan [b]	65	— 1	32.2	0.31	2.2
Marion †	63	2	33.8	1.00	
Meade †	71	3	41.9	0.69	
Medicine Lodge †	67	6	35.2	0.85	3.0
Minneapolis †	61	— 2	32.3	0.34	1.0
Morantown †	57	4	32.8	0.34	1.4
Morland †	66	— 8	33.8	0.30	
Morton †	68	0	37.6	0.45	T.
Mounthope *1	68	4	36.8	0.46	1.0
Ness City †	60	9	38.6	0.65	
New England Ranch †	64	— 1	36.6	0.58	
Norton	60	— 7	28.6	0.45	T.
Norwich *1	70	4	38.1	0.82	4.0
Oberlin †				0.40	
Olathe †	56	0	31.0	1.28	5.0
Oswego †	65	6	37.4	0.65	3.0
Ottawa †	57	2	33.0	0.35	0.8
Paola †	58	5	32.2	0.35	2.0
Phillipsburg	62	— 6	34.2	1.23	5.0
Pleasant Dale †	67	— 3	34.2	0.84	
Pratt †	68	2	34.4	0.61	1.0
Rome *†	62	7	37.0	1.12	2.0
Russell †	65	— 2	34.6	0.73	
Salina †	62	— 1	32.6	0.40	1.0
Scott City †	67	—14	36.6	0.65	
Sedan †	68	7	37.8	0.54	T.
Sharon Springs *1	68	—10	35.9	0.25	
Topeka					2.6
Tribune †				0.50	
Ulysses †				0.60	T.
Wakefield *1	63	— 1	35.4	0.26	1.4
Wallace *1	60	—18	34.1	0.16	1.0
Wamego *1	60	0	30.8	0.40	4.0
Wellington *1	66	8	36.0	0.49	2.0
Wichita					0.9
Winfield *5	62	6	35.6	0.78	1.5
Winona *1	66	— 8	32.9	1.00	0.2
Yates Center †	62	2	32.4	0.57	3.0
Kentucky.					
Alpha †	74	6	40.6	0.86	T.
Anchorage	59	2	35.0	0.75	T.
Blandville †	61	3	35.9	1.70	T.
Bowling Green *a *1	62	4	36.2	1.15	
Bowling Green *b †	64	6	36.8	1.40	
Burnside †				1.05	
Caddo †	56	— 3	31.6	1.30	
Canton *†	65	10	38.8	2.31	T.
Carrollton *†	57	6	34.8	1.16	T.
Catlettsburg †				1.79	
Earlington	59	7	37.4	1.33	T.
Edmonton †	61	5	37.2	0.81	T.
Falmouth †				1.32	
Fords Ferry †	58	6	36.0	1.27	T.
Frankfort †	60	4	36.4	1.35	
Franklin *†	64	9	38.4	1.24	
Georgetown	59	— 2	35.4		
Greendale *1	59	1	35.1	1.42	0.3
Greensburg *†	61	5	36.2	0.70	
Harrods Creek †	61	3	35.2	0.71	
Henderson †	65	7	37.4	1.15	
Leitchfield †	62	3	34.7	1.31	T.
Lexington					0.2
Lola †	60	6	35.8	0.92	
Louisa †	57	0	34.8	1.29	T.
Louisville					T.
Marrowbone †	63	6	37.4	1.42	T.
Mount Sterling †	58	0	33.4	1.64	1.0
Owenton †	57	0	35.2	1.38	T.
Paducah *†				1.65	T.
Paducah *b †	60	8	37.2	1.68	
Pleasure Ridge Park †	59	3	34.5	0.88	0.1
Princeton †	60	3	33.3	1.08	1.0
Russellville †	64	7	38.7	1.40	T.
Sandy Hook †	61	3	36.2	0.62	
Shelby City *1	66	3	37.6	0.15	T.
Shelbyville †	59	2	34.7	0.91	0.1
Southfork † [2]			34.1	1.32	T.
Springfield †	67	2	35.0	1.44	1.2
Williamsburg †				1.33	
Louisiana.					
Abbeville	75	24	51.8	1.95	
Alexandria †	75	20	48.2	4.80	
Amite †	76	18	50.4	2.59	
Bastrop †	75	17	45.5	3.47	
Baton Rouge †	74	30	49.5	1.60	
Calhoun †	70	12	44.8	3.41	
Cameron †	75			3.05	
Cheneyville †	72	18	46.8	4.55	
Coushatta *b †	72	16	43.8	3.81	
Covington	75	16	47.4	1.54	
Donaldsonville †	80	24	52.0	2.13	
Elm Hall	77	21	51.4	1.18	
Emilie †	75	23	50.8	1.75	
Farmerville	73	17	44.7	4.88	
Franklin †	75	22	51.0	2.32	
Grand Coteau	73	25	51.4	1.70	
Hammond †	78	20	49.9	2.44	
Jeanerette †	79	23	53.1	2.84	
Lafayette †	77	21	52.2	2.70	
Lake Charles †	73	25	50.9	2.32	
Lawrence †	83	29	50.4	2.95	
Liberty Hill	77	16	46.6	5.69	
Maurepas [c]	78	19	48.2	2.73	
Melville †	73	18	49.7	1.16	
Monroe †	70	30	46.2	3.00	
Natchitoches	75	15	45.3	4.02	
New Iberia	76	25	52.0	2.10	
Oakridge †	73	18	44.3	3.11	
Opelousas †	73	18	49.8	3.04	
Oxford †	73	14	45.6	4.02	
Paincourtville †	81	23	52.9	2.18	
Plain Dealing †	69	17	44.0	7.79	
Rayne †	76	26	52.4	1.86	
Ruston †	71	15	46.0	4.79	
Schriever †	77	21	49.6	1.45	
Shellbeach	62	27	47.4	4.67	
Southern University †	75	24	50.7	2.90	
Sugar Ex. Station †	77	24	50.4	2.94	
Sugartown †	70	21	50.4	5.39	
Thibodeaux				1.94	
Trinity †	74	19	48.6	8.71	
Venice †	77	31	53.6	1.52	
Wallace	77	25	51.6	1.95	
West End				2.02	
White Sulphur Springs †	74	18	46.2	7.95	
Maine.					
Bar Harbor	44	—17	19.4	1.47	9.5
Belfast *6	39	—16	17.4	0.98	8.0
Cornish *1	36	—15	18.5	1.50	15.0
Eastport					7.7
Fairfield	41	—21	16.8	0.31	
Farmington † [3]		—16	14.7	0.80	8.0
Flagstaff †	35	—24	11.2	1.30	12.0
Gardiner	48	—16	18.8	0.87	8.0
Houlton †	35	—17	10.9	0.85	8.5
Kineo †	34	—23	11.8	0.37	9.5
Lewiston	40	—14	18.7	1.04	8.4
Mayfield	33	—22	13.4	0.94	10.5
North Bridgton	39	—14	17.2	0.97	9.8
Petit Menan *1	40	—12	21.0		
Portland					13.3
West Jonesport *1	40	—14	18.2		
Winslow				0.40	6.0
Maryland.					
Annapolis	54	5	31.0	2.70	
Bachmans Valley	52	4	29.2	1.40	1.0
Baltimore					1.0
Boettcherville *1	66	4	30.5	1.30	
Burkittsville				3.31	T.
Cambridge †	59	11	34.8	1.19	0.2
Charlotte Hall †	59	5	33.6	1.89	T.
Cherryfields † [2]			32.8	1.34	T.
College Park	62	8	35.0	1.81	0.5
Cumberland *a †	56	6	30.8	1.41	
Cumberland *b	70	5	35.6	1.52	0.2
Darlington †	58	5	30.4	1.34	0.5
Deerpark	50	—13	27.4	0.90	4.0
Denton †	62	7	33.8	1.52	T.
Easton †	59	8	32.5	1.18	
Ellicott City	60	10	34.6	1.79	T.
Fallston *1	55	9	31.0	1.91	1.0
Frederick *a	60	— 5	32.4	2.09	T.
Frederick *b *1	55	9	33.4		
Greatfalls * [5]	55	9	32.0	2.23	
Greensprings Furnace	59	0	30.8	2.54	T.
Hagerstown †	61	6	32.2	2.20	
Hancock	65	0	31.7	2.07	
Jewell †	60	6	33.2	1.38	T.
Johns Hopkins Hospital	59	8	32.2		
McDonogh *	55	6	32.8		
Mardela Springs †	61	6	33.1	0.98	T.
Mt. St. Marys College *1	56	5	31.1	0.96	T.
New Market	55	5	30.8	2.58	T.
Oakland †	52	— 7	27.2	2.18	8.7
Pocomoke City	64	9	38.0	1.33	T.
Princess Anne	61	4	32.6	1.21	T.
Sharpsburg	57	5	30.7	2.70	T.
Solomons †	61	11	34.9	1.54	T.
Sunnyside	50	— 6	25.1	1.73	8.5
Upper Marlboro †	59	4	31.8	1.86	0.5
Western Port	54	0	28.6	2.02	0.7
Westminster	54	4	32.0	2.07	0.4
Woodstock	55	5	31.4	1.76	0.5
Massachusetts.					
Adams	40	—16	21.1		14.0
Amherst	42	—13	21.8	0.91	6.5
Amherst Ex. Station [b]	41	—12	23.2	1.07	6.5
Andover	44	—13	21.9	1.55	8.0
Ashland				2.30	
Attleboro				1.92	
Bedford	42	—11	21.5	2.17	13.0
Beverly Farms	42	—13	22.8	3.14	11.0
Bluehill (summit)	41	—14	21.7	2.71	13.0
Bluehill (valley)	42	—12	20.9	2.48	
Boston *a				2.06	8.8
Boston (W. B.)					9.5
Brockton *a	55	—12	24.0	1.69	9.8
Brockton *b				2.14	
Brockton *c				1.84	
Cambridge *a	43	—10	25.5	3.06	
Cambridge *b	43	—10	22.0	2.46	
Chestnut Hill	46	—12	23.2	2.80	10.0
Clinton				1.88	
Cohasset				3.05	7.0
Concord †	43	—12	20.7	1.83	10.5
Dudley [1]	38	—15	21.6	1.25	8.5
East Templeton *1	38	—17	19.8	1.62	14.0
Egg Rock, Nahant	45	—12	24.3		
Fallriver	43	—10	25.4	2.32	13.5
Fiskdale				1.00	8.0
Fitchburg *a *1	38	—12	20.9	2.37	14.0
Fitchburg *b	42	—14	21.1	1.34	14.8
Florida				1.20	14.0
Framingham	42	—11	22.6	2.43	
Groton	42	—14	20.3	2.14	19.5
Hadley	38	—12	18.6		
Hingham				2.44	9.8
Hobbs Brook				2.33	10.5
Hyannis *† [1]	48	— 8	29.7	2.48	12.0
Hydepark *6		—14	21.5		11.0
Lake Cochituate	46	—16	22.2	2.43	
Lawrence	42	—14	21.1	1.61	10.5
Leeds	42	—11	19.6	1.99	12.5
Leicester	38	—16	18.9	1.78	9.8
Leominster				1.63	15.0
Long Plain *6	44	—12	24.1	2.35	14.5
Lowell *a	41	—12	21.1	2.24	
Lowell *b	42	—14	20.0		
Lowell *c	45	—10	23.8		
Ludlow Center	36	—10	20.0	0.92	8.0
Lynn *a	46	—12	21.6	2.78	8.3
Lynn *b	42	—10	23.8		8.0
Mansfield *1	42	—13	23.1	2.92	11.5
Middleboro	44	—10	22.6	2.36	15.1
Milton	46	—10	25.1	2.33	12.0
Monroe	36	—20	16.2	1.41	22.5
Monson	42	—17	25.3	1.79	9.0
Mount Nonotuck				0.76	6.5
Mount Wachusett				1.40	14.0
Mystic Lake				2.77	
Mystic Station				2.72	
Nantucket					6.7
Natick *1	39	—14	21.3	3.70	8.0
New Bedford *a	45	—11	25.5	2.05	12.7
New Bedford *b	46	—10	24.8	2.19	12.8
North Billerica	45	—10	24.2	2.13	13.0
Pittsfield	36	—14	19.0	1.13	2.0
Plymouth *1	44	— 8	27.2	2.75	13.5
Princeton				1.96	9.5
Provincetown	45	3	27.9		5.5
Quinapoxet				1.69	14.0
Roberts Dam				2.34	10.0
Roxbury	43	—10	24.9	2.43	9.5
Salem				2.71	15.5
Salisbury				2.80	10.0
Somerset *1	45	—13	24.4	2.27	18.0
South Clinton				2.12	
Springfield Armory	41	—16	21.8	0.76	10.0
Sterling				1.63	13.4
Taunton *b	44	—10	23.4	2.80	13.0
Taunton *c	43	—11	22.3	3.06	
Taunton *d	42	—12	19.9	3.00	16.0
Turners Falls	37	—11	20.3	1.09	
Vineyard Haven					4.5
Wakefield †	41	—13	21.9	2.80	8.0
Waltham				2.77	
Webster				1.51	11.8

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Massachusetts—Con'd.	°	°	°	*Ins.*	*Ins.*
Westboro†	42	−11	21.8	2.15	13.0
Williamstown*¹	37	−14	21.1	0.71	7.1
Winchendon				1.14	15.0
Winchester				1.94	
Woods Hole					7.0
Worcester *a*	40	−15	20.6	1.67	
Worcester *b*	40	−12	23.2	1.93	8.0
Michigan.					
Adrian	47	−14	24.2	1.74	3.2
Albion	45	− 2	27.8	0.55	1.0
Allegan	45	− 6	26.2	1.12	5.0
Alma	44	− 8	23.1	2.00	7.4
Alpena					10.6
Ann Arbor	42	− 5	24.0	0.95	3.0
Arbela	42	− 7	24.0	1.11	4.5
Ball Mountain	42	−11	23.1	1.15	6.7
Battlecreek	42	− 7	24.9	1.49	4.4
Baraga	38	− 5	19.6	2.59	29.5
Benton Harbor	50	3	26.8	1.90	6.4
Benzonia	39	− 2	22.6	1.51	15.1
Berlin*¹	47	− 8	24.0	0.98	5.5
Berrien Springs	49	1	26.7	1.90	14.0
Birmingham	42	− 5	24.9	0.65	2.5
Boon	42	−25	20.8	0.99	9.6
Bronson	46	− 8	23.0	1.24	1.5
Calumet	38	− 7	17.8	2.23	29.0
Charlevoix	38	− 2	23.4	0.79	8.9
Cheboygan	36	−10	19.7	2.40	27.9
Clinton	48	− 8	24 9	1.36	0.5
Detroit					2.6
Fairview	41	− 7	22.6	0.58	1.9
Fitchburg	43	−12	23.7	1.35	4.5
Flint	46	−10	23.2	0.45	
Gladwin	41	− 2	24.4	0.60	6.0
Grand Haven					8.0
Grand Rapids *a*	46	−13	25.4	1.44	10.4
Grand Rapids *b*	45	− 7	25.0	0.80	
Grape	52	− 4	26.8	0.85	0.2
Grayling	38	−13	19.6	1.85	18.5
Hanover	45	− 7	27.3	1.02	3.8
Harbor Springs	38	− 9	22.4		
Harrison	44	−10	21.0	1.52	10.2
Harrisville	36	−10	21.6	2.35	20.0
Hart		0		0.90	8.0
Hastings	44	−14	24.9	1.02	3.5
Hayes	38	0	24.6	0.94	8.0
Hesperia	39	−11	24 1		
Highland Station	42	− 10	22.8	1.13	7.0
Holland*⁹	48	4	28.0		
Howell	46	−12	22.9	0.98	5.0
Ivan	44	− 6	21.5	1.28	8.0
Jeddo	38	− 5	22.4	0.86	3.2
Kalamazoo	46	− 3	24.0	1.56	12.5
Lansing	45	− 8	23.0	1.11	2.5
Lathrop	36*	−18*	16.0*	1.00	10.0
Lewiston	44	− 9	20.8	1.74	
Madison	44	−10	24.1	1.35	3.8
Manistique[7]	37	8	24.7	1.41	
Marquette					18.2
Mayville	41	− 6	23.3	1.00	4.5
Middle Island*¹⁰	40	2	27.6		
Mottville	52	− 9	24.6	1.58	1.5
Mount Pleasant	46	−10	22.3	1.25	4.0
North Marshall	41	− 8	22.5	1.12	1.0
Old Mission	41	3	25.2	1.52	15.2
Olivet	41	− 5	24.5	2.23	9.5
Ovid	42	− 6	23.4	0.78	2.0
Owosso	44	−10	22.8	1.03	2.0
Parkville				1.61	6.0
Pontiac	44	− 8	23.9		
Powers	37	−16	16.0		
Rockland	40	−17	16.1	2.90	16.0
Romeo	44	− 7	24.2	1.70	
St. Ignace	35	−14	20.3	2.18	20.5
St. Johns	45	− 5	24.2	0.61	2.0
Sand Beach *a*	42	− 5	23.2		
Saranac				0.75	
Sault Ste Marie					42.6
Somerset	45	− 7	23.4	0.99	1.8
South Haven	48	2	25.2	2.35	9.5
Stanton	43	−10	22.9	0.80	
Thornville	44	− 4	25.6	1.58	10.5
Three Rivers	54	− 6	28.1	1.34	2.0
Thunder Bay Island*¹⁰	38	− 2	24.1		
Vandalia	52	− 1	27.4	1.66	5.4
Ypsilanti	39	−13	22.9	1.40	2.4
Minnesota.					
Ada†	39	−36	3.8	0.54	5.0
Albert Lea†	48	−17	17.2	0.08	0.3
Alexandria *a*†				0.66	6.6
Argyle†	39	−30	0.1	0.35	3.5
Beardsley†	47	−20	10.0	1.72	14.5
Bellepiaine*¹	42	−19	14.8	0.40	T.
Bingham Lake	52	−18	17.1	T.	T.
Bird Island	48	−19	14.2	0.70	7.0
Blooming Prairie†	44	−19	17.2	0.25	2.5
Bonniwell†	45	−20	13.6	0.25	2.5
Breese†	36	−48	0.4	0.67	9.1
Caledonia†	43	−21	17.7	0.58	5.2
Cambridge†	44	−22	12.5	0.88	5.5
Camden†	51	−17	16.3	0.55	4.0
Collegeville	48	−22	15.2	0.37	4.9
Crookston†	39	−36	0.1	1.58	7.8
Dawson*¹	46	−21	8.8	0.59	6.3
Detroit City†	47	−36	8.2	0.20	2.0
Duluth					13.3
Faribault†	47	−18	18.0	0.26	2.5
Farmington†	45	−24	14.9	0.98	9.0
Fergus Falls†	42	−28	10.4	0.90	7.1
Glencoe†	47	−20	15.9	0.09	
Glenwood†	44	−26	11.5	0.85	9.8
Grand Meadow†	44	−20	15.5	0.43	6.0
Grand Portage†				1.96	
Granite Falls†	51	−19	13.3	0.10	
Hutchinson†	45	−20	13.8	0.42	4.2
Koochiching†	40	−49	12.6		
Lake Winnibigoshish*¹	39	−38	7.0	0.83	13.4
Lambert†	48	−38	4.9	0.75	7.5
Lawrence†	41	−22	14.1	0.80	8.0
Leech Lake[1]	44*	−48	5.2	1.26	12.6
Long Prairie†	44	−26	10.3	0.80	8.2
Lutsen†	37	−25	13.2	3.35	29.0
Luverne†	49	−15	18.2	0.25	2.6
Mantorville*¹	42	−20	17.3	0.77	2.7
Mapleplain	43	−22	19.6	0.96	8.7
Maplewood*¹	42	−20	15.1	0.61	6.1
Mazeppa[1]	42*	−19	17.4	1.00	10.0
Milan†	49	−23	10.4	0.76	7.5
Minneapolis *a*†	43	−21	15.0	0.85	6.6
Minneapolis *b*[6]	44*	−20	15.0	0.77	7.5
Minneapolis (W. B.)					5.2
Minnesota City†	46	−20	19.4	0.52	4.5
Montevideo†	49	−20	11.3	0.75	4.5
Morris†	50	−24	11.5	0.40	4.0
Mount Iron†	36	−38	6.8	1.35	15.5
New London	47	−24	11.4	0.21	2.1
New Richland*¹⁵	48	−22	19.4		
New Ulm†	50	−18	18.0	0.26	2.3
Park Rapids†	41	−41	7.5	0.92	8.0
Pine River*¹	47	−27	9.4	1.69	18.8
Pleasant Mounds†	53	−16	19.6	0.30	1.0
Pokegama Falls[1]	34*	−45	5.4	0.88	9.0
Red Lake†	42	−39	6.4	0.51	10.0
Rolling Green†	50	−14	19.9	0.60	1.3
Roseau[6]	36	−43	0.3	0.75	4.9
St. Charles†	45	−20	17.1	0.57	5.2
St. Cloud	42	−25	11.5	1.05	8.0
St. Olaf	42	−24	9.9	1.00	12.0
St. Paul					6.8
St. Peter*†[1]	52	−19	17.9	0.71	3.8
St. Vincent					13.7
Sandy Lake Dam[1]	42*	−36	9.3	0.69	10.8
Sauk Center	42	−28	11.4	0.55	5.5
Shakopee[6]	41*	−18	16.3	0.91	4.2
Sunrise*[6]	42	−18	14.1		11.0
Tower†	40	−43	8.5	1.10	11.0
Two Harbors†	49	−27	16.4	0.71	9.5
Wabasha*¹	48	−20	17.6	0.93	7.5
Willmar†	45	−21	11.2	0.35	4.2
Winona	44	−16	17.4	0.37	4.0
Worthington	46	−15	18.0	0.65	0.5
Zumbrota[1]	46*	−28	17.5		
Mississippi.					
Agricultural College	63	17	43.4	4.15	T.
Austin†	66	16	45.6	6.15	
Batesville†	64	15	41.9	3.47	
Bay St. Louis†	62	25	49.0	2.95	
Biloxi†	66	22	47.6	2.60	
Briers†	70	21	47.0	7.39	
Brookhaven†	76	14	47.5	5.38	
Canton†	70	21	45.8	4.36	
Columbus *a*†				2.53	
Crystal Springs†	72	20	46.1	5.39	
Edwards	74	18	45.4	4.88	
Fayette†	72			7.92	
French Camps†	69	10	41.8	3.12	
Fulton†	65	12	41.4	2.37	
Greenville *a*	68	19	43.2	2.59	
Greenville *b*†	68	13	41.2	3.29	
Itta Bena†	71*	18*	45.0*	4.12	
Jackson†	71	16	43.6	4.52	
Kosciusko†	72	15	43.7	3.79	
Lake† [2]	66	25	46.4	3.20	
Leaf*¹	70	22	48.9		
Leakesville†	73	17	50.2	3.93	
Logtown†	74	21	50.4	2.32	
Louisville†	69	13	44.0	2.81	
Magnolia	77	17	48.7	3.21	
Mayersville	69	16	44.8	4.70	
Mico†	71	15	45.4	7.23	
Mosspoint†	70	24	51.4	3.95	
Natchez†	75	20	48.0	5.10	
Okolona†	65	11	41.2	2.46	
Palo Alto†	66	17	43.0	2.61	
Pontotoc†	68	15	43.8	3.85	T.
Port Gibson†	74	18	46.2	8.41	
Rosedale†	68	16	42.3	4.92	
Stonington*¹	76	20	47.5		
Thornton†	68	18	50.7	4.50	T.
Topton*⁵	70	22	48.0	3.40	
Valden†	76	14	45.4	4.21	
Water Valley*†¹	67	15	42.4	4.01	
Waynesboro *a*†	66	20	44.6	4.45	
Woodville†	75	19	48.2	6.15	
Yazoo City†	73	10	42.8	3.80	
Missouri.					
Akron				0.70	6.5
Appleton City†	58	4	33.2	0.38	3.0
Arthur*†[3]		5	31.5	0.30	3.0
Bethany				0.91	4.0
Bigpiney				0.30	
Birchtree	63	4	36.8	1.22	0.8
Boonville†				0.90	8.0
Brunswick	58	− 1	30.9	0.70	
Carrollton†	55	3	32.0	0.70	4.0
Cedargap*[3]	64	4	37.0	1.30	T.
Columbia					5.7
Conception	52	2	30.2	0.27	2.0
Cowgill*[3]	54	0	32.0	0.88	3.5
Darksville†	60	0	29.8	0.70	3.0
Downing				0.95	5.0
East Lynne*[3]		2	30.8	0.48	4.0
Edgehill*[3]	58	4	35.6	1.07	0.5
Eightmile*¹	56	1	32.5	0.67	3.0
Eldon*¹	60	4	35.0	1.30	2.0
Elmira	67	− 3	29.6	0.81	7.2
Emma*[3]		4	33.1	0.45	2.0
Fairport				0.73	6.0
Farmersville				0.70	4.0
Fayette	60	1	31.6	0.97	3.5
Fulton				1.40	3.0
Gallatin*¹	52	− 4	29.3	0.95	5.0
Gayoso*[3]		18	36.3	2.94	
Gordonville*[3]		9	34.8	3.12	0.5
Gorin*[3]	60	0	28.6	1.54	5.5
Grovedale	62	3	35.8	1.19	0.5
Halfway	62	4	35.8	1.20	1.0
Hannibal					2.7
Harrisonville†	52	0	31.4	0.34	2.0
Hastain[5]	61	2	33.8	1.14	4.0
Hermann†				1.74	0.3
Houston	63	5	37.3	0.55	T.
Houstonia (near)				0.67	4.4
Humansville	62	1	34.4	0.42	2.0
Irena				0.91	5.6
Ironton*†[1]	61	5	35.0	1.73	0.5
Jefferson City†	61	5	34.5	1.51	2.0
Kansas City					6.3
Kidder	52	− 3	28.2	1.31	9.3
Lamar	64	5	35.0	0.30	3.0
Lamonte				0.72	4.0
Lebanon	62	3	36.0	1.13	0.8
Lexington†	60	1	31.8	0.72	3.0
Liberty	55	2	31.4	0.74	5.2
McCune*†[1]	62	2	33.7	2.44	2.5
Mansfield				1.28	T.
Marblehill	61	6	35.6	2.55	0.5
Marceline	54	− 2	30.1	0.82	5.0
Marshall†	58	− 1	30.2	0.58	3.0
Maryville*[4]	53	− 6	25.3	1.12	4.3
Mexico†	60	2	32.3	1.40	6.0
Miami				0.95	
Mine La Motte†	62	5	35.4	1.31	0.1
Mineralspring	63	5	39.0	1.59	3.0
Mount Vernon	60	1	32.4	1.03	4.0
Neosho	64	3	36.0	1.11	3.5
Nevada				0.62	5.0
New Haven*¹	60	8	37.6	1.30	1.0
New Madrid	64	9	40.4	3.97	6.6
New Palestine†				0.81	4.0
Oakfield†	62	3	34.7	1.64	0.5
Oak Mound				1.53	2.0
Oak Ridge				1.03	1.4
Olden				1.34	1.1
Oregon *a*	58	− 4	30.1	1.41	9.4
Oregon *b*¹	52	− 4	28.6	1.15	9.5
Osceola†				0.45	3.0
Oto				1.30	2.0
Palmyra*[3]	58	− 2	30.0	1.70	6.0
Phillipsburg*†[1]	60	4	34.5	1.17	1.8
Pickering*[3]	62	− 6	28.8	1.17	4.5
Platte River*[3]	54	0	28.1	1.39	12.0
Poplar Bluff	64	7	38.0	2.09	T.
Potosi	61	− 1	33.2	1.52	T.
Princeton*¹	57	− 6	29.2	0.45	4.0
Rhineland	62	1	33.0	1.81	1.0
Rolla				1.08	0.6
St. Charles	64	3	35.1	1.60	T.

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Missouri—Cont'd.	°	°	°	*Ins.*	*Ins.*
St. Joseph†	.....	.....	.....	0.59	5.0
St. Louis	60	4	32.8	1.52	T.
St. Louis (W. B.)	.....	.....	.....	.....	T.
Sarcoxie*[3]	.....	6	32.4	0.75	3.4
Shelbina	.....	.....	.....	1.60	5.0
Sikeston	63	10	39.7	2.15	.....
Springfield	.....	.....	.....	.....	3.5
Steffenville	.....	.....	.....	1.12	5.0
Stellada†	61	— 1	32.4	0.50	5.0
Sublett	54	— 5	27.9	0.80	6.0
Tindall	.....	.....	.....	0.60	6.0
Trenton	50	0	28.9	0.70	7.0
Unionville†	58	— 9	25.8	1.74	3.2
Vermont*†[1]	59	3	31.8	0.71	5.0
Virgil City	.....	.....	.....	0.61	4.3
Warrensburg*[1]	56	6	35.0	0.55	4.0
Warrenton	62	1	32.8	1.51	2.0
Wheatland	.....	.....	.....	0.65	4.0
Willow Springs	71	6	38.8	1.21	0.7
Zeitonia*[1]	66	10	34.0	1.34	0.6
Montana.					
Bigtimber†	63	—14	28.0	0.31	5.5
Billings†	62	—20	25.0	0.25	2.5
Bozeman†	65	—17	24.4	0.50	5.0
Butte†	48	— 8	26.2	0.30	4.7
Chinook†	52	—30	7.3	1.25	12.0
Choteau†	64	—26	19.0	1.45	13.5
Cokedale†	52	—17	31.0	0.46	4.6
Columbia Falls†	50	—12	23.2	2.51	.....
Deerlodge†	53	—15	26.2	0.42	3.0
Dillon†	49	—11	25.1	0.30	3.0
Fort Benton†	62	—31	13.2	0.80	8.0
Fort Custer†	50	—30	20.1	0.21	2.1
Fort Keogh†	50	—27	14.6	0.68	6.8
Fort Logan†	56	—32	22.6	.....	.....
Fort Missoula	50	— 6	23.7	1.41	14.3
Glasgow†	51	—32	5.4	0.71	.....
Glendive†	50	—29	10.2	1.70	17.0
Greatfalls†	58	—26	22.2	0.55	9.2
Havre	.....	.....	.....	.....	13.5
Helena	.....	.....	.....	.....	7.2
Hogan†	50	—33	21.4	2.31	24.0
Kipp†	52	—41	13.1	1.35	13.0
Lewistown†	52	—33	19.4	1.63	16.5
Libby†	50	—19	24.0	2.57	35.0
Livingston†	57	—15	29.4	0.37	3.7
Manhattan†	53	—14	24.8	0.65	0.5
Martinsdale†	49	—25	23.2	0.65	6.5
Marysville†	49	—25	22.8	1.60	20.0
Miles City	.....	.....	.....	.....	4.6
Musselshell†	59	—30	18.4	0.35	3.5
Poplar	44	—28	5.8	1.49	14.9
Radersburg†	.....	.....	.....	0.32	3.2
Redlodge†	55	—21	23.8	0.65	6.5
Sun River†	55°	—29°	21.0°	0.16	1.6
Toston	45	—17	25.0	.....	2.0
Troy†	45	— 9	25.1	4.04	13.0
Utica†	55	—29	22.9	0.80	8.0
Virginia City†	48	— 6	25.4	0.67	6.5
White Sulphur Springs†	52	—22	26.8	0.50	5.0
Wibaux†	62	—26	17.2	0.60	6.0
Yale†	55	—28	20.6	0.55	5.5
Nebraska.					
Agee*[1]	63	—10	25.0	0.11	0.7
Albion	60	—10	26.3	0.23	0.9
Alliance	.....	.....	.....	0.60	4.0
Ansley†	61	—14	28.5	0.62	0.5
Arapaho	.....	.....	.....	0.03	.....
Arborville*[1]	60	— 6	29.6	0.30	T.
Ashland *a*†	65	— 7	29.1	0.21	0.5
Ashland *b*†[1]	59	— 6	29.1	0.49	0.1
Ashton	61	—10	28.1	0.26	T.
Auburn*†[1]	64	— 6	29.9	1.23	5.0
Aurora*[1]	59	— 5	30.4	0.29	T.
Bassett	63	—14	25.6	0.53	0.5
Beatrice†	61	— 5	28.4	0.40	4.0
Beaver City	65	— 9	33.1	0.56	0.5
Benkelman*[1]	66	— 4	36.0	0.22	.....
Bluehill*[1]	62	— 8	31.1	0.50	1.0
Bratton*[1]	64	— 6	28.7	0.39	3.5
Brokenbow*[1]	78	—10	32.6	0.07	0.5
Burchard*[1]	56	— 5	29.4	0.09	1.0
Burwell*[1]	52	—10	26.4	0.35	1.0
Callaway†	60	—12	27.3	0.25	T.
Central City*[3]	60	0	28.4	0.28	0.2
Chester*[1]	62	— 7	29.7	0.37	0.5
Columbus†	62	— 6	28.8	0.44	0.5
Cornlea	.....	.....	.....	0.52	1.0
Creighton*†[1]	61	—11	23.7	.....	.....
Crete	63	— 6	30.4	0.54	1.5
Culbertson	.....	.....	.....	0.56	T.
Curtis *a*†	61	—12	30.6	0.31	T.
Curtis *b*	.....	.....	.....	0.50	.....
David City*†[1]	60	— 8	27.0	0.60	1.0
Divide*[1]	62	— 6	30.8	0.24	T.
Nebraska—Cont'd.					
Dunning*[1]	59	—10	28.6	0.12	1.0
Edgar*[1]	65	— 7	29.9	0.70	1.5
Ericson*†[1]	65	— 9	26.1	0.05	T.
Fairbury†	58	— 3	29.9	0.18	1.0
Fairmont*[1]	63	— 5	31.0	0.53	0.5
Fort Robinson	62	—17	30.0	1.30	13.0
Franklin†	65	— 7	31.8	0.70	2.0
Geneva†	64	— 7	29.5	0.47	0.6
Genoa†	60	— 8	26.4	0.46	1.3
Gering†	60	—18	28.1	0.40	4.0
Gibbon	63	— 7	31.1	T.	T.
Gothenburg	63	—10	32.8	0.36	0.5
Grand Island *a*[1]	64	— 5	29.8	T.	T.
Grand Island *b*	62	— 7	29.1	0.14	T.
Greeley	.....	.....	.....	T.	T.
Haigler*[1]	78	—14	30.3	0.42	0.8
Hartington†	61	—11	23.2	0.25	1.5
Harvard*[1]	60	—10	28.4	0.30	0.5
Hastings*[1]	58	—10	26.9	0.30	0.8
Hayes Center†	.....	.....	.....	0.75	T.
Hay Springs†	61	—18	25.0	0.49	4.3
Hebron†	64	— 6	29.5	0.40	0.5
Hickman*[5]	62	— 8	30.6	0.31	3.1
Imperial *a*†	64	—15	30.9	0.50	T.
Imperial *b*	50	— 9	29.7	0.38	.....
Indianola*[5]	65	—18	31.2	T.	T.
Kearney*[1]	66	—10	29.9	0.30	.....
Kennedy†	65	—13	26.1	0.28	T.
Kimball†	59	— 8	31.2	0.40	4.0
Kirkwood*[1]	73	—11	28.3	0.50	T.
Lexington†	63	—10	31.2	0.38	1.0
Loup *a*	60	— 8	30.3	0.34	.....
Loup *b*	60	— 8	30.7	0.26	.....
Lynch*†[1]	62	—10	24.3	0.16	0.2
Lyons	.....	.....	.....	0.30	0.5
McCook*[1]	62	— 4	34.0	0.24	T.
McCool	.....	.....	.....	0.53	.....
Madison*[1]	62	— 9	23.6	0.27	0.5
Madrid*†[5]	65	—10	29.4	0.50	.....
Marquette*	.....	.....	.....	0.20	0.2
Milford*[3]	.....	— 4	27.2	0.51	0.6
Minden *a*[1]	62	— 7	29.7	0.75	0.6
Minden *b*	.....	.....	.....	0.37	.....
Nebraska City *a*	62°	— 4°	34.5°	0.28	1.5
Nebraska City *b*[1]	64	— 1	31.2	0.47	2.8
Nemaha City*[1]	54	— 6	26.4	0.50	5.0
Nesbit†	56	—13	29.5	0.16	T.
Norfolk†	59	—10	25.6	0.27	T.
North Loup†	63	— 9	28.2	0.24	T.
North Platte	.....	.....	.....	.....	0.6
Oakdale†	60	—11	24.3	0.13	0.2
Odell*[5]	60	— 6	31.0	0.15	1.0
Omaha (W. B.)	.....	.....	.....	.....	1.7
O'Neill*[1]	64	—12	25.1	0.32	0.5
Ord	63	— 6	30.7	0.21	1.0
Osceola	.....	.....	.....	0.55	0.5
Ough†	.....	.....	.....	0.71	.....
Palmer *a*[1]	56	—10	25.6	0.00	.....
Palmer *b*	.....	.....	.....	0.17	T.
Plattsmouth *a*†	.....	.....	.....	0.54	4.5
Plattsmouth *b*	60	—12	29.9	0.32	4.5
Potter*[1]	58	—12	28.0	0.27	5.0
Ravenna *a*	63	— 8	30.2	0.35	0.4
Redcloud *a*	.....	.....	.....	0.49	T.
Redcloud *b*[1]	64	— 8	32.5	0.57	1.8
Republican*[1]	62	— 8	32.0	0.35	1.5
Ralo*[1]	56	— 2	32.5	0.40	4.0
St. Paul	63	— 8	30.4	0.21	.....
Salem*[1]	60	3	33.2	0.32	3.2
Santee Agency†	64	—12	24.5	0.07	T.
Schuyler	.....	.....	.....	0.22	0.7
Seneca*[1]	64	—12	29.8	0.20	0.5
Seward*[5]	60	— 7	30.6	0.51	.....
Spencer	64	—11	28.2	0.35	.....
Springfield*[1]	58	— 8	27.0	0.39	2.0
Springview	60	—13	25.8	0.25	T.
Stanton*[1]	58	—10	24.8	0.12	T.
State Farm	64°	— 8	30.4	0.28	.....
Strang*[1]	65	— 6	30.2	0.42	0.5
Stratton	.....	.....	.....	0.42	.....
Stromsburg	.....	.....	.....	0.47	.....
Superior*[5]	59	—10	29.9	0.42	0.5
Sutton	64	— 6	29.3	0.77	1.4
Syracuse	.....	.....	.....	0.15	.....
Tecumseh *a*†	61	— 5	28.8	0.80	5.5
Tecumseh *b*	.....	.....	.....	0.18	3.0
Tekamah	63	— 9	26.6	0.45	0.5
Thedford*[1]	62	—14	24.7	0.35	1.5
Turlington†[1]	62	—13	25.5	0.57	5.1
Wakefield	.....	.....	.....	0.31	1.3
Weeping Water*[1]	61	—11	24.6	0.59	3.2
Whitman*[1]	56	—20	24.6	0.05	0.5
Wilber*[1]	64	— 2	31.9	0.32	1.5
Wilsonville*[1]	62	— 8	31.7	0.35	T.
Woodlawn	.....	.....	.....	0.38	.....
York*[1]	60	—10	35.5	0.90	.....
Nevada.					
Austin	51	12	34.0	1.39	9.0
Battle Mountain*[1]	53	12	35.3	0.60	2.5
Belmont	51	11	32.9	1.79	12.0
Beowawe*[1]	52	5	30.7	0.25	2.5
Candelaria	63	22	40.8	0.90	T.
Carlin*[1]	51	—10	22.4	0.37	1.2
Carson City	62	12	37.9	4.82	0.2
Carson City (W. B.)	.....	.....	.....	.....	0.3
Cloverdale*[3]	64	.....	32.4	0.63	4.0
Clover Valley†	.....	.....	.....	1.61	7.0
Cortez†	.....	.....	.....	2.60	22.0
Cranes Ranch	.....	.....	.....	1.00	.....
Darrough Ranch	.....	.....	.....	1.05	.....
Downeyville	62	20	41.2	0.68	1.0
Elko*[3]	50	— 5	28.5	0.94	5.5
Elko (near)	52	—10	25.6	3.35	8.5
Ely	55	5	30.8	0.65	.....
Empire Ranch†	57	0	30.8	0.35	2.5
Fenelon*[1]	51	0	27.0	0.98	5.5
Genoa	57	11	38.0	6.08	.....
Golconda*[1]	56	14	35.6	0.65	0.5
Gold Hill	54	15	36.7	4.75	3.5
Halleck*[1]	55	—10	26.0	0.97	5.5
Hamilton	79	— 7	34.0	1.71	17.1
Hawthorne *a*[3]	57	21	40.9	1.08	.....
Hawthorne *b*	58	20	40.2	1.08	.....
Hot Springs*[1]	55	10	39.3	0.81	1.0
Humboldt*[1]	55	11	36.7	0.71	T.
Keysers Springs	.....	.....	.....	0.02	0.2
Las Vegas	63	15	40.1	0.11	.....
Lewers Ranch	58	17	38.4	10.70	1.8
Lovelock*[1]	62	18	42.8	0.40	1.0
Mill City*[1]	58	10	32.0	0.60	1.0
Osceola†	65	2	37.0	1.36	2.0
Palisade*[1]	49	0	30.6	0.27	2.8
Palmetto	58	6	33.8	2.10	12.0
Reno*[3]	60	18	36.9	2.35	.....
Reno State University	60	14	36.9	2.87	.....
Reese River	.....	.....	.....	1.34	2.3
Ruby Valley†	.....	.....	.....	0.92	9.5
St. Clair	59	9	36.8	1.04	1.2
St. Thomas	75	11	43.3	0.60	.....
San Antonio	54	10	35.8	1.12	7.6
Silverpeak	62	8	38.0	0.06	.....
Stofiel	45	—26	19.8	1.88	8.5
Sunnyside	63	—15	29.7	1.03	2.0
Tecoma*[1]	48	7	28.7	0.43	0.5
Toano*[1]	50	8	29.0	0.25	2.0
Tuscarora*[1]	49	14	29.4	1.87	7.2
Tybo	48	13	32.8	0.92	11.0
Verdi*[1]	51	12	35.8	9.40	.....
Wadsworth*[1]	68	8	34.0	3.22	T.
Wells	48	— 6	28.6	1.55	3.8
Winnemucca	.....	.....	.....	.....	3.4
New Hampshire.					
Alstead*[1]	37	—22	16.7	0.84	9.2
Belmont	.....	.....	.....	0.84	.....
Berlin[4]	37	—34	14.0	.....	.....
Berlin Mills	38	—25	13.6	1.61	18.5
Bethlehem	37	—25	14.7	0.57	9.0
Brookline*[1]	43	—14	23.0	1.67	15.5
Concord	43	—17	18.9	1.23	10.0
Dublin	40°	—18	20.0	1.81	12.9
Durham	44	—14	20.5	1.15	11.5
Grafton†	37	—30	15.9	0.54	8.5
Hanover	37	—19	16.9	0.67	9.8
Keene	39	—17	18.1	0.89	9.5
Lakeport	.....	.....	.....	0.92	.....
Mine Falls	.....	.....	.....	1.92	.....
Nashua	44	—14	19.6	1.93	16.2
Newton	43	—15	20.8	1.62	5.0
North Conway	37	—15	18.0	0.85	10.0
Pennichuck Station	.....	.....	.....	1.57	.....
Peterboro	41	—16	17.6	1.39	12.7
Plymouth	36	—19	15.3	0.39	7.4
Sanbornton†	39	—18	17.1	0.55	7.9
Stratford	40	—28	16.4	0.67	10.0
Weirs Bridge	.....	.....	.....	0.56	.....
West Milan	42	—27	12.4	2.30	28.0
Wolfboro	.....	.....	.....	0.58	.....
New Jersey.					
Allaire	51	1	28.9	.....	.....
Asbury Park	47	— 5	28.9	1.65	1.5
Barnegat	59	2	33.0	1.50	1.5
Bayonne	50	2	28.2	1.05	3.6
Beachhaven	50	4	30.8	1.50	0.2
Belvidere	45	— 3	26.1	0.68	4.8
Beverly†	57	2	30.2	2.22	3.9
Billingsport*[1]	48	4	28.4	2.21	2.0
Blairstown	47°	6°	29.6°	1.08	7.0
Boonton	45	— 5	25.1	1.62	5.0
Bridgeton	55	10	33.4	1.81	T.
Camden	51	4	29.4	2.25	1.0
Cape May	56	11	33.4	1.30	T.
Cape May C. H.†	55	7	32.9	1.19	0.5
Charlotteburg	57	— 2	25.1	1.89	6.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
Chester	44	— 6	24.4	1.35	4.5
College Farm	47	0	28.0	1.68	T.
Deckertown	44	— 5	23.4	1.39	6.0
Dover	45	— 4	24.2	2.12	6.0
Egg Harbor City	58	1	29.4	2.56	0.5
Elizabeth†	47	— 2	27.4	1.39	2.0
Englewood	46	— 3	25.4	1.57	4.2
Franklin Furnace	45	— 6	25.6	1.47	3.5
Freehold	48	— 1	27.8	2.26	3.2
Friesburg				1.23	T.
Gillette	48	0	26.2	1.29	3.0
Hammonton				2.37	1.0
Hanover	45	— 2	26.1	1.41	2.8
Hightstown	48	0	28.7	2.30	3.0
Imlaystown	50	1	29.4	2.11	1.4
Junction				1.29	3.5
Millville	61[4]	5[4]	31.4[4]	1.43	T.
Moorestown	53	2	30.0	2.81	3.0
Newark *a*	47	— 1	28.6	1.32	2.8
Newark *b*†	47	— 1	28.1	1.26	3.5
New Brunswick *a*	50	— 1	28.8	1.65	2.5
New Brunswick *b*	55	2	28.9	1.57	
Newton	44	— 6	24.2	0.63	3.0
Ocean City	53	3	30.0	2.30	0.5
Oceanic	53	3	31.0	1.33	3.2
Paterson	50	2	29.2	0.84	4.8
Perth Amboy	48	0	28.0	1.58	4.0
Plainfield	53	— 1	29.4	1.68	5.1
Rancocas				1.78	2.2
Readington*[2]	54	4	31.9		
River Vale	47	— 5	25.2	0.86	1.5
Somerville	49	— 7	26.7	1.46	2.0
South Orange	47	— 1	27.4	1.45	4.0
Toms River	52	0	28.8	1.75	
Trenton	52	5	31.9	1.32	T.
Vineland	54	2	30.4	1.90	T.
Whiting	56	2	31.4	2.12	1.0
Woodbine	60	1	30.1	2.44	
New Mexico.					
Albert†	70	14	41.2	0.35	
Albuquerque†	57	14	36.1	0.06	T.
Alma†	65	8	39.1	0.21	0.4
Aztec†	59	3	32.4	0.16	1.0
Bernalillo†	59	14	31.2	0.01	
Chama†	69	— 3	32.2	1.65	16.5
Colfax	60	3	35.4	0.13	1.5
Deming*[2]	75	18	44.7	0.00	
East Las Vegas	66	5	36.8	0.19	2.2
Eddy†	75	20[4]	47.2	0.14	
Engle†	67	14	40.1	0.00	
Espanola†	55	— 3	31.3	0.04	T.
Estalina Springs†				0.17	1.2
Fort Bayard	68	13	42.0	0.25	0.5
Fort Union†	65	8	36.2	T.	T.
Fort Wingate	70	5	37.8	0.12	1.2
Galisteo†	62	10	35.6	0.28	
Gallinas Spring†	67	5	38.4	T.	T.
Gila	68	12	42.4	0.14	
Hillsboro†	60	15	41.6	0.18	T.
Las Cruces†	71	9	41.3	0.31	
Lordsburg*[2]	63	14	42.0	T.	
Los Lunas†	65	6	34.7	T.	
Lower Penasco	68	10	41.3	0.80	7.0
Monero†	48	— 8	26.4	0.78	8.0
Ocate†	69	5	34.7	0.05	0.5
Puerto de Luna†	69	15	41.2	0.15	
Rincon†	70	11	42.2	0.09	
Roswell†	74	10	43.3	0.60	T.
San Marcial†	66	11	39.0	0.01	
Santa Fe					2.2
Shattucks Ranch	69	18	43.0	0.52	2.2
Springer	61	—12	31.1	0.17	T.
Sulphur Hot Springs†[2]	53	0	26.0	0.70	8.0
Taos†	60	— 4	30.5	0.52	3.5
Winsors Ranch				0.25	
New York.					
Addison	47	—12	24.8	1.47	
Akron				3.08	
Albany					7.1
Alfred	45	—18	21.5	2.51	13.8
Angelica†	43	—22	22.1	2.34	13.0
Appleton	39	0	24.3	3.10	13.7
Arcade	42	—20	21.4	2.35	11.5
Atlanta				2.13	
Avon	40	—18	21.8	1.97	
Baldwinsville	39	—22	19.5	3.53	25.0
Bedford	46	— 7	25.5	1.40	6.8
Big Sandy*[10]	35	—26	16.6		
Binghamton†	44	—14	21.0		
Bloomville	48	—23	18.1	2.26	8.5
Bolivar				1.95	
Boyds Corners				1.09	
Brentwood[b]	44	— 3	22.6		
Brookfield*[1]	42	—28	18.1	1.50	15.0
Brooklyn	45	0	28.2	1.54	5.0
Buffalo					8.2
Canton†	36	—26	13.2	2.25	22.5
Carmel	42	— 9	21.9	1.10	4.2
Charlotte*[10]	38	—10	25.5		
Cherry Creek				3.60	
Cooperstown†	36	—21	17.0	1.48	12.0
Cortland	40	—23	20.0	1.86	
De Kalb Junction				1.40	
Demster				1.61	
Deposit				1.30	
Eagle Mills				1.30	
Easton				0.75	
Elmira†	45	— 5	24.6	1.56	5.5
Fleming	42	—14	22.8	1.80	18.0
Fort Niagara†	40	— 2	24.4	2.80	
Friendship	45	—23	23.2	2.03	10.3
Fulton				3.93	
Glens Falls	39	—14	17.7	1.08	7.5
Gloversville	39	—20	16.6	1.47	13.9
Hamilton	40	—32	17.3	1.38	12.1
Haskinville				2.16	
Honeymead Brook	43	—18	20.6	0.91	5.3
Humphrey†	44	— 7	24.0	2.43	17.0
Ithaca	42	—15	22.8	1.46	6.9
Jamestown	46	— 3	25.6	3.08	18.0
Kings Station				1.15	
Lebanon Springs	38	—18	18.8	0.87	11.6
Lowville	37	—32	15.4	2.33	23.0
Lyons	40	—14	24.2	3.57	21.0
Madison Barracks†	53	—21	16.1	1.05	18.5
Malone	53	—27	12.2	1.34	18.4
Middletown	42	— 8	21.3	1.89	8.5
Mohonk Lake	41	—14	20.3	1.49	7.0
Mount Morris	45	—10	24.9	2.60	6.0
Newark Valley				1.30	
New Lisbon	37	—26	17.2	0.86	18.5
New York					3.0
North Hammond*†[1]	34	—30	15.3	1.06	11.8
Number Four†	34	—31	15.4	3.04	28.2
Ogdensburg	41	—23	14.2	1.09	10.9
Oneonta	42	—16	21.9		
Oswego					14.5
Oxford	40	—21	20.1	1.99	14.5
Palermo†	37	—30	18.4	2.00	11.2
Perry City	40	—30	20.7	1.68	10.9
Pine City				1.82	
Pittsford*	40	4	26.4	1.91	2.5
Plattsburg Barracks	37	—20	14.4	2.05	12.9
Port Jervis	41	— 7	21.8	1.55	7.0
Potsdam	34	—23	11.2	1.80	18.0
Poughkeepsie	44	—10	21.0	0.88	6.8
Ridgeway				3.00	
Rochester					22.5
Rome	48	—17	20.6	2.17	
Romulus	42	—15	23.2	2.34	8.0
Rose†				2.63	
Saranac Lake	36	—31	11.7	1.11	18.2
Setauket†	46	— 1	27.8	1.48	4.5
Sherwood				1.82	
Skaneateles				2.08	
South Canisteo	47	—15	23.6	2.76	16.3
Southeast Reservoir				1.80	
South Kortright†	49	—30	17.9		
Turin	35	—24	14.2	4.42	40.1
Tyrone				1.67	
Varysburg	47	—24	21.8	3.38	12.5
Victor	41	—14	22.4	2.36	18.2
Wappingers Falls	42	—10	22.4	1.36	9.5
Warwick				0.97	
Waverly†	48	—12	23.6	1.66	9.2
Wedgwood	51	—11	22.0	1.72	8.8
Westfield	48	3	27.7	2.00	9.0
West Point†	49	— 9	22.8	0.83	0.4
Willets Point	45	— 1	26.5	1.10	T.
North Carolina.					
Asheville†	58	4	31.1	3.38	
Bryson City†				2.68	1.0
Chapel Hill†	66	14	38.2	3.39	
Charlotte					0.1
Currituck Inlet				0.65	
Experimental Farm	65	12	39.0	3.32	
Fair Bluff†				3.36	
Falkland*[1]	69	14	38.1	2.27	
Fayetteville†	64	17[6]	41.0	3.98	
Greensboro†	62	15	38.4	2.16	
Greenville				2.81	
Henderson†	67	12	38.4	3.75	
Highlands	59	— 1	33.3	4.34	5.0
Highpoint	62	10	36.8		
Horse Cove†	58	5	36.5	4.74	3.0
Lenoir*†[1]	56	11	36.1	2.32	
Linville†	55	— 2	31.2	3.82	
Littleton†	60	10	37.2	3.00	
Louisburg†	62	12	37.6	2.97	
Lumberton†	64	15	43.0	4.65	
Lynn*†[2]	65		37.2	3.61	0.5
Marion	70	9	38.2	2.25	
Mocksville†	67	13	39.6	2.24	
Moncure†	68	15	38.2	1.53	
Morganton*†[1]	64	8	36.4	3.35	
Mountairy†	61	8	35.8	1.96	
Mount Pleasant	65	13	39.4	2.06	
Murphy†				2.64	0.5
Newbern†	68	11	43.9	3.55	
Oakridge†	70	12	38.9	1.82	
Pantego				3.31	
Pittsboro	59	12	37.6	3.80	
Raleigh*†[1]	60	14	41.5	2.80	
Rockingham†	67	15	42.9	1.12	
Roxboro†	62	10	36.6	2.96	
Rutherfordton†	51	12	35.0	2.80	
Salem†				1.98	
Salisbury	65	13	37.8	2.04	
Saxon†	56	6	36.2	1.92	
Selma	67	11	40.3	2.80	
Settle	64	10	39.8	1.63	
Skyuka	65	8	38.0	4.42	0.1
Sloan†	67	15	42.9	3.06	
Soapstone Mount†	65	7	37.0	2.57	T.
Southern Pines†	74	15	44.4	3.02	
Southport†	64	15	45.5	4.42	
Springhope*[1]	57	15	37.5	1.85	
Tarboro	67	11	39.6	2.45	
Waynesville†	61	5	36.0	1.91	0.5
Weldon†	59	12	37.9	2.61	T.
Willeyton	63	11	37.8		
North Dakota.					
Amenia	43	—34	5.9	0.60	5.8
Ashley†	45	—25	11.6	0.81	8.1
Bismarck					8.6
Churchs Ferry	38	—30	2.8	1.08	9.3
Coalharbor†	45	—28	4.9	1.85	18.5
Dickinson†	47	—24	10.2	0.92	9.2
Ellendale	50	—21	8.2	0.50	5.0
Falconer	46	—27	6.8	0.50	5.0
Fargo†	43	—29	4.3	0.19	1.5
Forman†	41	—35	4.9	0.49	4.4
Fort Berthold†	52	—25	12.8	0.65	6.5
Fort Yates†	58	—24	10.1	0.56	6.2
Gallatin†	39	—42	3.9	0.73	4.0
Grafton†	37	—36	—0.4	0.53	5.3
Grand Rapids	44	—34	6.2	0.60	6.2
Jamestown†	48	—24	9.6	1.00	9.0
Kelso†	44	—33	4.0	1.04	9.6
Lakota†	42	—36	1.6		
Lemert	40	—36	2.6	0.55	5.5
McKinney	39	—33	2.8	0.78	7.8
Milton†	36	—39	—0.6	0.50	5.0
Minto	40	—38	0.5	0.78	7.8
Napoleon†	41	—25	7.5	1.05	10.5
Oakdale†	54	—27	13.5	0.49	4.9
Portal†	38	—31	2.0		
Power†	46	—30	5.9	0.66	9.6
St. John†	45	—32	1.6	0.74	7.4
Steele†[2]	46	—27	6.8	0.65	6.5
University†	36	—30	3.8	0.50	5.0
Wahpeton	48	—29	9.2	0.35	3.5
Wildrice†[2]			6.0	0.81	8.1
Williston					20.7
Willow City†	39	—40	1.3	0.30	3.0
Woodbridge†	38	—39	—2.4	0.58	5.8
Ohio.					
Akron	52	— 2	28.6	1.78	2.2
Annapolis	54			0.20	1.0
Ashland	50	— 8	27.4	1.58	1.2
Ashtabula	47	3	27.0	2.34	11.5
Athens	55	— 1	31.8	2.24	0.7
Atwater				1.90	0.8
Auburn	45	0	25.8	1.53	1.5
Bangorville	50	— 6	27.8	1.71	1.0
Basil				1.84	2.0
Bellefontaine	52	—10	26.2	1.77	3.1
Benton Ridge	56	— 8	27.1	2.07	8.5
Bethany	52	— 5	30.8	2.04	0.2
Bigprairie	53	— 3	29.1	1.58	T.
Binola	48	— 4	28.1	1.33	2.3
Bissells	44	— 4	25.8	1.45	5.1
Bladensburg	58	— 3	29.8	1.99	0.1
Bloomingburg	59	— 5	31.6	1.38	T.
Bowling Green	55	— 7	26.8	1.45	1.0
Bucyrus	48	— 6	28.2	2.10	2.0
Caledonia				1.68	2.4
Cambridge	52	— 1	29.7	1.43	
Camp Dennison	54	— 1	33.0	1.64	0.6
Canal Dover	56	— 1	29.4	1.99	0.5
Canton†	51	—10	29.4	1.98	1.7
Cardington	50	— 6	28.2	1.38	1.5
Carrollton	44	— 1	27.7	0.86	T.
Cedarville				2.46	1.5
Celina	56	— 8	31.4	0.73	
Cherryfork	58	0	31.8	1.59	
Cincinnati					1.4
Circleville*b*	58	— 1	32.0	1.81	T.

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Clarksville	56	— 4	31.4	1.99	0.7
Cleveland (V. O.)	46	— 1	28.6	1.73	4.4
Cleveland (W. B.)					3.4
Clifton	58*	— 6*	30.0*	2.13	1.1
Coalton	58	— 3	31.6	1.65	1.5
Colebrook	43	— 4	26.3	1.07	4.2
Columbus					3.0
Dayton *a*	58	— 5	32.0	1.82	1.0
Dayton *b* †				1.89	
Defiance	70	— 9	27.6	0.92	
Demos	55	— 2	29.6	2.00	
Dupont	52	— 9	27.0	3.40	3.0
Elyria	50	— 3	28.7	1.73	2.3
Fairport Harbor *10	42	7	28.2		
Fayetteville	52	— 4	31.2	1.80	0.5
Findlay	53	—10	27.5	1.37	2.0
Fostoria	47	— 9	26.6	0.66	1.0
Frankfort	53	0	32.3	1.12	0.5
Garrettsville	50	— 3	27.9	1.62	1.8
Granville	52	— 3	29.2	2.88	0.8
Gratiot	51	— 2	29.8	1.87	2.6
Greenfield	52	— 2	31.8	1.17	
Greenhill	50	— 2	27.2	1.78	1.8
Greenville	50	— 7	28.3	1.53	0.5
Hackney	59	1	35.2	1.89	1.0
Hanging Rock	58	3	33.6	1.35	
Hebbardsville	63	— 3	33.2	1.28	0.1
Hedges	52	—10	25.2	1.54	3.5
Hillhouse	46	— 2	25.6	1.50	11.5
Hillsboro	61	— 5	31.8	1.72	
Hiram	48	— 5	26.0	2.23	3.2
Hudson	52	— 5	28.6	1.37	
Jacksonboro	57	— 6	30.8	1.85	1.0
Kenton †	56	— 8	28.2	1.53	3.8
Killbuck	53	— 4	28.9	1.63	T.
Lancaster	48	— 1	30.0	2.31	2.5
Leipsic	50	—10	26.0	1.10	1.0
Levering	52	0	27.0	1.47	
Logan	55	— 2	32.2	2.19	2.2
Lordstown	47	— 2	26.7	1.62	0.5
McArthur	54	0	30.9	1.91	1.0
McConnelsville	56	— 1	31.7	1.92	0.5
Mansfield				1.47	2.7
Marietta				1.43	
Marietta *b*	60	4	33.6	1.83	3.5
Marion	51	— 7	29.6	0.66	0.7
Medina	55	— 4	27.4	1.51	T.
Milfordton	54	0	27.6	1.83	2.0
Milligan	57	— 1	31.6	1.61	1.0
Millport	53	— 2	30.2	1.64	T.
Montpelier	47	— 7	24.1	1.65	1.5
Napoleon	50	— 9	25.4	1.40	0.0
New Alexandria	52	1	29.8	2.78	6.0
New Berlin	51	— 2	27.4	1.65	0.5
New Bremen	55	—10	28.2	1.16	5.7
New Comerstown	52	0	29.7	1.91	T.
New Holland	51	— 2	30.4	1.85	1.3
New Moscow				1.78	0.8
New Paris	60	— 9	29.6	1.56	1.0
New Waterford				1.74	0.2
North Lewisburg	52	— 8	28.2	1.60	3.5
North Royalton	49	1	27.3	1.53	3.0
Norwalk	56	—10	26.0	0.97	T.
Oberlin	45	— 8	27.5	0.60	1.0
Ohio State University	52	— 4	31.1	1.67	1.7
Orangeville	44	— 1	26.7	1.35	T.
Ottawa	51	— 8	27.2	1.57	2.5
Pataskala	52	— 4	29.4	2.27	3.8
Peoli	50	0	28.0	1.81	1.0
Philo	51*	— 2*	28.4*	1.78	T.
Plattsburg	55	— 6	29.2	1.92	2.0
Pomeroy	56	0	32.6	0.80	T.
Portsmouth *a* †				1.39	
Portsmouth *b*	68	2	36.2	1.98	T.
Richwood				1.40	0.2
Ridgeville Corners	49	—11	24.4	1.26	1.0
Ripley	54	— 2	33.0	1.71	0.9
Rittman	50	— 4	26.9	1.84	T.
Rosewood	51	— 8	27.0	1.70	1.0
Sandusky					0.9
Sharon Center	53	— 5	30.4	0.92	1.5
Shenandoah	53	— 7	27.2	2.40	11.0
Sidney *a*				1.58	0.7
Sinking Spring	60	— 2	32.4	1.73	0.3
Springboro				2.30	T.
Spring Valley	51	— 5	28.6	1.92	0.5
Stoutsville				2.19	1.0
Sylvania	45	— 8	24.6	1.70	4.0
Thurman	60	1	33.0	1.00	0.0
Tiffin †	50	— 5	28.5	1.50	0.5
Toledo					1.3
Upper Sandusky	52	— 6	28.6	1.62	4.2
Urbana	50	— 7	28.8	1.49	1.0
Vanceburg	59	1	34.6	0.83	T.
Van Wert	53	— 9	26.6	1.48	2.5
Vermilion	51	— 6	26.9	1.92	7.0
Vickery	50	— 5	27.9	1.68	2.0
Walnut				1.92	2.5
Warren	47	— 1	27.8	2.01	1.3
Warsaw	56	— 4	28.4	1.72	T.
Wauseon	52	—10	25.2	2.20	3.2
Waverly	56	— 1	33.2	1.57	0.5
Waynesville				2.14	0.5
Wellington	56	4	29.8	1.42	2.0
Westerville	52	— 3	31.2	1.71	2.0
Willoughby				1.53	2.5
Wooster *a*	53	— 2	27.9	1.73	T.
Wooster *b*				1.49	0.2
Youngstown	46	— 4	27.2	1.45	1.5
Oklahoma.					
Alva †	66	8	36.2	1.00	0.2
Anadarko †	72	7	42.0	0.85	
Arapaho †	70	8	38.7	1.51	
Britton				0.44	
Buffalo	66	28	46.0	1.20	
Burnett	71	7	40.6	0.91	T.
Clifton †	66	6	39.2	0.77	0.5
Enid	68	10	39.2	0.94	0.5
Fort Reno †	68	9	38.7	0.40	T.
Fort Sill	70	10	41.2	1.40	
Guthrie †	64	10	40.6	0.45	1.0
Hennessey †	70	8	42.5	0.59	
Keokuk Falls †	65	8	36.9	0.65	1.5
Mangum †	79	11	43.6	1.67	
Norman †	67	12	41.2	0.74	
Oklahoma					0.2
Ponca †	66	8	39.4	1.13	1.8
Pondcreek †	67	6	36.0	0.65	2.0
Prudence †				1.54	0.8
Sac and Fox Agency †	68	7	42.6	0.80	1.0
Stillwater †	64	11	39.6	0.55	0.8
Winnview	67°	9°	39.6°	2.10	1.0
Woodward †	62	8	37.4	1.04	0.5
Oregon.					
Albany *a* †	61	22	43.1	8.98	1.5
Arlington †	54	12	36.2	1.48	7.0
Ashland *b*	60	25	42.0	4.09	
Astoria					0.5
Aurora **	60	26	45.0	6.09	
Aurora (near)	59	21	41.2	6.60	7.5
Bandon	60	31	48.5	18.49	
Beulah †	47	— 6	28.8	3.26	11.0
Brownsville **	68	20	42.8	9.11	
Burns	45	— 5	22.4	1.50	15.0
Canyon City †	61	13	40.6	2.55	5.0
Cascade Locks	52	22	37.7	11.85	
Comstock **	60	24	44.8	9.65	
Corvallis *a*	60	22	42.0	8.35	2.0
Corvallis (near)	57	22	41.6	10.13	
Crook	48	— 3	31.6	1.40	6.5
Dayville †	63	14	40.0	3.44	4.5
Detroit †	41	19	32.4	14.86	
Eugene † *a*	66	25	44.1	7.56	2.0
Eugene † *b*				8.48	
Fife †	49	3	33.6	1.86	1.0
Forest Grove	54	22	39.6	10.84	8.0
Gardiner	64	31	46.8	16.58	
Glenora	56	20	38.4	27.12	
Grants Pass *a* †	61	24	42.0	8.95	
Happy Valley †	52	— 1	32.5	1.76	3.0
Heppner	61	13	39.1	1.96	13.0
Hood River (near)	46	12	33.2	7.61	34.5
Hubbard	58	22	40.8	8.29	8.0
Irvington				4.86	8.0
Jacksonville	60	25	40.0	5.90	
Joseph †	56	0	29.5	1.47	12.0
Junction City **	62	26	44.6	10.15	2.2
Lafayette **	60	26	43.6	7.98	
Lakeview †	47	5	29.3	3.55	4.0
Langlois	70	31	50.4	22.10	
Lone Rock	56	5	32.4	1.05	10.5
Lorella	54	2	32.9	10.23	5.0
McMinnville *a* †	56	20	40.6	9.32	10.0
Merlin **	52	18	39.1	11.08	
Monmouth **	55	20	42.3	3.03	17.0
Mount Angel †	59	22	42.1	8.10	3.5
Nehalem				18.41	2.2
Newberg	56*	21	41.4*	8.36	5.0
Newbridge	55	1	33.2	1.10	11.0
Newport	64	32	45.3	11.09	
Pendleton	62	14	39.6	1.34	7.4
Portland					6.0
Riddles **	54	30	41.1	8.57	
Roseburg					T.
Salem *b* †	68	23	43.3	6.35	8.0
Salmon	49	10	31.1	14.02	66.0
Sheridan **	57	22	43.2	8.49	
Silver Lake	52	4	32.2		
Silverton **	58	18	40.7	9.53	3.0
Siskiyou **	46	25	38.3	8.72	8.0
Sparta	49	7	28.6	4.19	21.0
Springfield **	61	20	40.6	10.61	1.5
Oregon—Cont'd.	°	°	°	*Ins.*	*Ins.*
The Dalles †	52	19	35.8	3.45	15.0
Tillamook Rock L. H.				6.38	
Toledo	57	21	42.4	14.68	
Vale	55	3	33.4	2.78	16.0
West Fork **	60	34	46.2	14.80	
Weston	58	8	36.0	3.52	8.0
Williams	58	25	41.6	7.60	
Pennsylvania.					
Altoona				0.87	
Aqueduct	54	5	29.6	1.35	1.4
Beaver Dam †				1.62	T.
Bethlehem				1.26	
Brookville †				0.80	2.0
Browers Lock				1.27	
Cameron				1.28	0.4
Carlisle	59	5	29.1	1.72	2.0
Cassandra	50	— 4	29.1	2.10	11.0
Cedarrun				1.80	T.
Center Hall †				2.18	4.5
Chambersburg †	60	3	28.4	1.10	0.2
Coatesville	57	4	28.9	1.36	2.7
Confluence †				1.27	2.0
Coopersburg	58	1	30.6	1.13	2.6
Davis Island Dam †				1.61	
Doylestown				1.03	
Drifton *	40	—5	21.0		1.0
Driftwood				1.91	
Dubois †				1.38	4.2
Duncannon				1.14	1.0
Dyberry †	43	—13	19.2	1.43	11.0
East Bloomsburg				0.96	0.3
East Mauch Chunk	47	— 1	26.4	1.89	5.2
Easton	47	— 1	26.6	1.03	3.8
Edinboro *1	39	— 4	24.5		
Ellwood Junction †				1.67	
Emporium	46	— 1	26.8	1.17	2.2
Erie					7.6
Farrandsville				0.60	2.0
Forks of Neshaminy *1	50	10	31.6	1.80	4.5
Frederick				0.83	
Freeport †				1.64	
Gettysburg †	56	5	28.8	0.75	1.0
Girardville				1.39	4.5
Grampian	40	— 6	24.2	1.22	6.5
Greensboro †				1.51	
Hamburg	49	2	29.2	0.80	
Harrisburg					1.0
Hollidaysburg	58	0	28.2	1.81	1.5
Huntingdon *a* †	55	3	29.6	2.27	4.7
Huntingdon *b*				2.13	
Johnstown †				0.66	
Karthaus				1.00	
Keating				2.25	2.5
Kennett Square	55	5	30.3	1.52	1.2
Lancaster	56	9	29.9	0.50	1.0
Lansdale				1.11	
Lebanon	50	3	26.4	1.11	2.6
Le Roy †	40	—10	21.8	2.00	6.3
Lewisburg	49	1	27.9	1.98	3.2
Lock Haven *a* †	50	1	27.6	1.20	4.0
Lock Haven *b*				0.85	
Lock No. 4 †				2.00	T.
Lycippus	49	— 2	28.8	1.59	2.1
Mifflin				2.20	
Oil City †				1.77	1.3
Ottsville				1.66	1.6
Parker †				0.87	
Philadelphia *b*				1.62	3.0
Philadelphia *c*	54	4	31.4	1.70	1.0
Philadelphia W. B.	58	5	31.1	1.83	0.1
Pittsburg					1.0
Point Pleasant					0.7
Pottstown				1.32	
Quakertown	54	4	29.4	1.97	1.0
Reading †	50	— 5	26.8	1.30	3.0
Renovo			28.4	1.06	
Ridgway †				2.12	
Saegerstown				1.76	2.5
Salem Corners	46	—10	24.8	1.33	7.3
Scranton	50	—12	22.8	2.19	14.5
Selinsgrove	45	— 6	24.3	0.78	6.0
Shinglehouse	48	1	26.9	0.90	T.
Sinnamahoning	60	—15	25.9	2.46	11.0
Smethport				0.84	
Smiths Corners	47	— 6	24.6	1.60	8.0
Somerset				1.25	
South Bethlehem *1	50	—11	27.2	1.71	8.0
South Eaton	59	2	28.8		
Spruce Creek	45	— 4	24.1	0.52	5.0
State College				2.20	
Sunbury	46	1	26.6	1.40	8.0
Swarthmore				0.80	
Towanda	53	4	29.4	1.72	0.8
Uniontown	46	— 5	23.7	0.84	5.0
Warren †	54	1	32.0	2.14	1.0
				1.32	7.0

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Pennsylvania—Cont'd.	°	°	°	*Ins.*	*Ins.*
Waterville				0.70	
Wellsboro *†[1]	43	— 8	23.6	1.50	8.5
West Chester	53	4	29.2	1.87	2.0
West Newton †				1.96	1.0
White Haven	47	— 5	23.4	0.79	5.5
Wilkesbarre †	45	0	26.0	1.14	5.0
Williamsport	46	1	27.1	1.76	1.0
York †	56	5	29.5	0.94	1.0
Rhode Island.					
Block Island					8.9
Bristol	43	— 8	25.4	1.91	8.5
Kingston	43	—10	23.4	2.59	12.0
Lonsdale				2.41	13.0
Narragansett Pier					7.0
Pawtucket	43	— 4	25.0	1.84	12.4
Providence *a*	46	— 8	25.1	3.52	14.5
Providence *c*	44	—10	23.9	2.03	9.0
South Carolina.					
Allendale	66	14	43.0	3.36	
Anderson †				4.36	
Blackville †	68	12	42.7	2.38	
Camden †				2.63	
Central †	66	10	39.6		
Cheraw *a* †	65	13	42.1	1.51	
Cheraw *b* †				1.73	
Conway †				3.35	
Darlington (near)				1.98	
Edisto				2.30	
Effingham †				2.65	
Florence †	65	17	43.6	2.61	
Georgetown †	67	17	45.4	3.45	
Gillisonville †	72	11	46.4	2.54	
Greenville †	68	12	43.0	3.67	
Greenwood †	64	18	38.3	4.48	
Holland †	66	12	39.4	4.70	T.
Kingstree *a* †	65	20	46.8	2.77	
Kingstree *b* †				2.75	
Little Mountain	72	16	44.9	3.61	
Longshore †	67	14	42.0	4.54	
Mount Carmel †				3.81	
Pinopolis *[1]	62	18	45.4	2.94	
Port Royal †	68	25	48.6	3.74	
St. George †	66	9	43.6	2.65	
St. Matthews †	68	12	43.4	2.85	
St. Stephens †				2.74	
Santuck †	65	14	40.5	3.26	T.
Shaws Fork *[1]	70	24	47.8	3.60	
Smiths Mills †				3.51	
Society Hill †	65	15	43.0	2.17	
Spartanburg †	72	14	40.4	1.99	2.0
Statesburg †	66	19	44.2	2.57	
Trenton	67	20	45.4	3.62	
Trial †	72	12	46.4	2.96	
Yemassee †	70	24	47.2	2.18	
Yorkville	68	16	42.8	2.64	
South Dakota.					
Aberdeen †	32	—21	11.3	0.77	2.6
Alexandria †	39	—20	18.0	0.15	1.5
Ashcroft †	63	—28	18.8	0.40	4.0
Brookings †	51	—21	16.0	0.18	2.5
Buffalogap *[1]	60	—14	27.9	0.30	3.0
Castlewood †	48	—24	12.8	0.75	7.5
Clark †	48	—31	13.7	0.70	7.0
Cross †	64	—21	26.8	0.25	3.9
De Smet †	62	—23	20.6	0.20	2.0
Edgemont				0.13	0.3
Farmingdale				0.09	2.0
Faulkton †	54	—26	12.6	0.26	2.5
Flandreau †	54	—21	16.6	0.67	2.8
Forestburg †	58	—18	17.2	0.15	0.5
Fort Meade	79	—20	26.4	0.66	5.9
Gary †	50	—19	14.6	0.44	5.5
Goudyville *†[3]	53	—20	11.4	0.19	T.
Greenwood	64	— 9	25.4	0.14	0.8
Highmore †	56	—20	16.8	T.	T.
Hotch City †	60	—17	19.6	0.14	0.2
Howard †	57	—18	17.8	0.20	2.0
Huron					2.3
Ipswich *†	48	—15	14.4	1.25	
Kimball †	58	—14	20.1	0.50	2.2
Leslie †	67	—28	19.8	0.03	0.3
Mitchell †	61	—18	20.6	0.06	0.9
Northville *[1]	54	—20	15.0	0.32	3.2
Nowlin †	64	—20	19.0	T.	T.
Oelrichs †	63	—24	28.7	1.10	11.0
Parker †	58	—15	20.5	0.50	2.0
Parkston *	66	—18	17.0	T.	T.
Pierre					7.4
Plankinton †	60	—17	18.8	0.24	1.0
Rapid City					3.5
Rosebud	63	—16	21.6	0.50	5.0
Sioux Falls †	55	—18	18.9	0.41	3.5
Tyndall †	64	—11	27.0	0.35	1.0
Vermillion	60	—12	23.9	T.	
Watertown †	52	—27	13.2	0.12	1.2
Webster †	47	—26	11.2	1.07	5.0
Wentworth †	53	—18	16.8	0.29	2.9
Wessington Springs †	56	—15	19.2	0.08	0.5
Yankton †	64	—10	23.9	0.11	
Tennessee.					
Andersonville *[1]	65	9	39.3	1.58	
Ashwood *†[1]	63	10	40.8	2.88	T.
Benton (near)	67	10	43.4	1.50	
Bluff City †				0.72	T.
Bolivar †	68	12	40.7	4.67	
Bristol †	55	5	35.0	1.59	0.5
Byrdstown †	66	6	37.8	1.62	T.
Carthage †				0.95	
Charleston †				2.65	
Charlotte *†[3]	62	8	38.1	1.50	T.
Chattanooga					0.2
Clarksville †	65	8	38.2	1.51	0.5
Clinton †				1.87	
Covington †	65	14	42.9	2.91	T.
Decatur †	63	9	39.8	2.39	
Dyersburg †	62	11	40.0	3.16	T.
Elizabethton †	71	8	38.0	0.46	1.0
Fairmount *[1]	55	6	37.1	1.93	T.
Florence †	65	10	39.7	1.38	T.
Franklin †	64	6	38.4	3.16	T
Greeneville †	66	6	37.8	1.20	0.5
Harriman	66	6	38.6	1.78	T.
Hohenwald *†[3]		9	34.8	2.99	1.2
Jackson †	67	12	39.4	4.42	
Johnsonville †	66	10	39.4	2.26	
Kingston				2.17	T.
Knoxville					T.
Loudon †				2.23	
Lynnville *[1]	65	10	41.4	1.95	1.0
McKenzie *†[1]	63	9	38.6		T.
McMinnville †	68	8	39.4	4.22	T.
Memphis					0.5
Nashville					0.1
Newport *[3]	69	11	36.2	0.99	T.
Nunnelly *[1]	63	9	39.6	2.80	
Palmetto †	66	10	41.5	1.80	T.
Perryville †				3.60	0.1
Riddleton †	61	8	38.8	1.31	T.
Rockwood †				2.53	
Rogersville *†[1]	67	9	38.0	1.49	1.2
Rugby *[1]	57	5	36.2	1.24	T.
St. Joseph †	71	10	40.6	2.82	T.
Sewanee †	65	5	38.9	1.30	T.
Springdale *[1]	68	9	39.6	1.34	1.0
Strawberry Plains †				0.89	0.2
Trenton	63	11	37.6	2.26	T.
Tullahoma †	65	6	38.8	5.85	1.0
Union City	62	9	38.2	1.91	T.
Waynesboro *[1]	66	11	39.8	4.00	
Texas.					
Albany *†[1]	62	19	45.7	1.96	
Alice †	85	32	58.2	0.60	
Amarillo					0.3
Angleton	78	26	55.8	4.25	
Arthur City †				2.44	
Aurora *[1]	72	14	44.9	2.60	
Austin *a* †	82	30	55.4	4.05	
Austin *b* *[3]	75	24	49.8		
Ballinger †	76	19	46.4	1.86	
Beeville †	83	28	55.4	2.60	
Boerne *†[1]	73	23	52.4	4.41	
Brady †	75	18	48.2	4.00	
Brazoria †	76	27	54.8	3.65	
Brenham †	73	24	50.7	6.65	
Brownwood	73	24	47.5	5.63	
Burnet *†[1]	78	18	48.4	4.00	
Camp Eagle Pass †	88	18	54.8	1.13	
Chillicothe	70	15	41.4	0.87	
Coldwater	60	1	34.4	0.50	
Coleman *[3]		17	45.3	3.00	
College Station	73	21	47.0	10.93	
Columbia †	74	24	52.2	3.55	
Corsicana *a* †	74	17	46.6	4.58	
Corsicana *b* †	79	9	45.6	3.90	
Cuero †	78	26	52.2	2.84	
Dallas †	70	12	43.4	4.74	
Dean †	70	6	37.6		
Dublin †	71	16	44.8	3.67	
Durham				0.38	
Duval *[1]	76	35	51.7	5.55	
El Paso					T.
Estelle †	74	12	45.0	3.57	
Forestburg †	80	12	48.5	1.44	
Fort Brown †	85	38	62.4	0.81	
Fort Clark	82	24	47.6	1.20	
Fort McIntosh	81	32	55.4	0.58	
Fort Ringgold †	90	22	58.2	0.48	
Fort Stockton †				0.11	
Fort Worth	74[f]	15[f]	47.0[f]	4.75	
Fredericksburg *†[1]	72*	20*	49.0*	3.08	
Gainesville	64*	14[4]	45.2*	2.49	
Georgetown *[1]	70	22	48.4	5.10	
Golindo				5.55	
Graham †	74	11	42.8	1.64	
Grape Vine †	71	14	45.6	3.31	
Hale Center †	76	13	45.4	0.80	
Hallettsville †	76	22	52.9	3.33	
Happy †	75	8	39.8	1.35	4.0
Hartley †	68	2	35.2	0.75	T.
Haskell †	70	16	42.8	1.52	
Hewitt				6.20	
Houston †	75	28	51.6	4.09	T.
Huntsville †	72	22	48.4	6.94	
Kent				0.24	
Kerrville †	80	14	48.6	3.27	
Lampasas †	78	20	49.8	2.76	
Leakey †	85	13	53.4	2.39	
Llano *†	77	22	50.0	2.50	
Longview †	72	18	44.8	8.18	
Luling †	75	23	52.2	5.07	
Marshall †	72	17	54.7	15.40	
Menardville *†	72	20	47.1	3.23	
Midland †	81	12	45.2	2.05	
Mount Blanco *†	75*	9	40.2	1.08	
New Braunfels †	72	23	51.1	3.01	
Orange †	69	24	49.0	1.63	
Panter				4.04	
Paris †	71	15	42.6	2.50	
Rheinland *[1]	71	14	44.1	1.28	
Roby †	85	2[1]	44.2[f]	0.94	
Rockport *[1]	70	32	55.4		
Rocksprings †	80	18	50.4	2.49	
Runge †	81	29	55.4	2.37	
San Antonio	80	25	54.5	2.72	
San Marcos *a* †				3.15	
Sierra Blanca †	70	20	48.8	T.	
Stafford †	75	25	51.5	3.87	
Sulphur Springs †	73	14	46.2	2.98	
Temple †	75	18	48.6	6.13	
Twohig †	92	25	61.0	1.57	
Tyler †	68	16	43.5	6.20	
Waco †	76	20	49.0	5.21	
Weatherford †	73	15	44.1	2.92	
Wichita Falls †	68	10	38.8	0.99	
Utah.					
Alpine City †				1.45	
Blue Creek *[3]	50	10	31.6	0.55	2.5
Castlegate †	49	1	28.3	1.10	10.0
Cisco †	56	0	31.0	0.23	
Corinne *[3]	54	— 5	29.1	1.10	1.0
Deseret †	57	0	31.2	0.82	
Fillmore †	60	9	33.9	0.75	
Fort Duchesne †	39	—17	11.9	0.06	0.6
Giles	59	1	29.2	0.10	
Grover †	58	2	31.2	0.35	4.5
Heber	45	—10	23.6	2.10	8.5
Huntsville †				2.45	3.5
Kelton *[3]	48	5	28.9	0.50	
Koosharem	53	0	29.8	0.20	T.
Levan †	50	3	30.2	1.16	2.5
Loa †	76	— 1	28.3	0.05	0.5
Logan †	50	— 1	27.9	1.31	
Manti †	54	— 4	29.6	0.15	1.5
Millville †				1.46	
Moab †	59	6	33.6	0.45	0.1
Moroni †				1.11	9.8
Mount Pleasant *†[1]	52	10	30.9	0.31	2.0
Ogden *b*	46	12	31.0	1.62	4.2
Pahreah †	57	7	36.2	0.50	
Parowan †	56	10	33.6	0.16	1.6
Promontory *[3]	52	0	25.5		
St. George †	66	7	38.6	0.40	
Salt Lake City					3.3
Scipio †	54	1	31.4	1.22	1.5
Snowville †	48	— 3	27.8	1.29	4.0
Soldier Summit †	46	—16	20.4	1.16	11.8
Terrace *[3]	59	11	27.5	0.15	T.
Thistle †	51	—11	25.8		14.0
Vernal †	46	— 2	20.9	0.48	7.0
Vermont.					
Brattleboro	40	—13	20.2	2.21	13.5
Burlington †	39	—17	18.4	0.63	7.5
Chelsea †	39	—26	13.8	0.94	11.0
Cornwall	41	—20	16.2	0.73	6.0
Enosburg Falls †	43	—22	16.0	1.30	13.0
Hartland †	39	—17	15.8	0.81	10.3
Irasburg †	35	—28	12.2	1.95	19.5
Jacksonville	36	—19	15.5	2.95	21.0
Northfield					12.3
Norwich	50	—13	21.3	0.64	10.0
St. Johnsbury	40	—20	15.5	0.67	9.5
Simonsville	36	—21	13.5		
Strafford *†[1]	35	—20	16.0	1.05	11.0
Vernon *[3]	36	—18	19.0	0.94	12.5
Wells	38	—22	17.4	0.83	7.5
Woodstock	39	—26	15.1	1.43	13.5
Virginia.					
Alexandria	66	12	37.6		

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Virginia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Ashland†	64	5	35.4	2.35	T.
Avon†	65	6	35.8	3.09	1.0
Bedford City†	57	9	35.3	2.16	
Big Stone Gap†	62	2	33.6	1.43	0.5
Birdsnest*†‡	68	14	36.5	2.35	
Blacksburg	56	3	31.9	1.51	T.
Buckingham†	60	3	33.8	3.30	T.
Callaville†	60	7	36.7	2.89	
Cape Henry					T.
Charlottesville	63	8	35.8	3.54	T.
Christiansburg†				1.07	
Dale Enterprise†	58	— 1	31.4	1.75	T.
Fredericksburg†	56	8	35.2	1.54	T.
Hampton	61	13	38.0	1.77	
Irwin†	58	3	35.2	2.80	
Lexington†	60	7	34.4	2.93	0.2
Lynchburg					T.
Maidens	66	14	43.0		
Manassas†	60	5	33.4	2.69	
Marion †[k]	58	5	32.4		
Monterey†	48	— 4	29.0	1.30	0.2
Norfolk					T.
Nottoway	61	4	36.4	3.26	
Petersburg†	62	9	37.0	2.58	0.4
Radford†				1.73	
Richmond (near)†	66	8	38.2	2.98	T.
Rockymount†	60	8	37.4	2.93	
Salem†	64	8	36.2	2.82	T.
Saltville	61	5	35.1	0.75	0.4
Smithville†	54	10	35.6	1.85	
Speers Ferry†				1.22	
Spottsville†	61	10	35.5	2.81	0.1
Stanardsville†	62	4	32.7	2.41	0.3
Staunton†	63	5	33.6	2.55	
Stephens City†	58	3	31.6	2.73	T.
Sunbeam†	55	10	36.8	2.26	T.
Warsaw†	61	7	34.4	1.67	
Westbrook Farm	60	9	35.8		
Wytheville	58	3	32.4	1.76	0.5
Washington.					
Aberdeen†	55	27	41.1	22.22	2.5
Anacortes				4.24	7.0
Ashford				10.91	14.0
Blaine†	57	9	34.4	7.05	8.8
Centerville†	56	13	35.0	2.03	9.5
Chehalis†	55	21	39.2	7.76	5.9
Colfax†	55	8	34.2	2.87	6.2
Connell†					6.0
Coupeville†	56	21	40.6	3.34	8.2
East Clallam					23.0
Eastsound†	58	17	40.0	4.69	13.8
Ellensburg†	41	— 3	23.5	1.89	
Ellensburg (near)	40	— 2	24.2	2.16	30.0
Fort Canby					1.0
Fort Simcoe	55	12	32.6	3.12	23.0
Fort Spokane	52	— 3	27.6	2.55	13.0
Grandmound†	54	19	39.8	7.08	3.8
Hunters†	57	— 6	25.3	3.26	15.0
Kennewick	74	10	40.2	0.35	4.0
Lakeside†	50	8	28.1	2.50	20.0
Lapush†	54	25	43.0	21.46	1.8
Madrone*†‡	57	25	40.8	10.80	10.5
Mayfield†	56	20	38.0	7.24	4.8
Montecristo†	50	15	33.3	16.43	87.0
Moxee Valley†	58	9	31.4	0.46	2.0
Neahbay					15.5
New Whatcom†	59	15	39.8	3.16	10.5
Olga†	55	17	40.0	3.54	9.5
Olympia†	55	23	41.1	10.86	1.0
Pine Hill†	49	17	34.4	4.42	25.2
Pomeroy†	62	11	38.9	3.38	16.8
Port Angeles					8.8
Port Crescent					12.3
Pullman†	51	5	32.2	2.75	8.0
Pysht					17.0
Rosalia†	50	— 2	31.0	2.75	6.2
Seattle					3.9
Shoalwater Bay*[10]	58	27	42.4		
Silvercreek*[1]	53	19	38.8	6.82	8.0
Snohomish†	50	21	40.7	7.38	4.7
Southbend†	67	22	42.8	17.44	1.3
Spokane					15.5
Stillaguamish†	58	15	37.2	6.01	4.5
Sunnyside†	58	11	32.6	1.44	8.0
Tacoma†	62	23	40.6	6.50	1.0
Tatoosh Island					6.1

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Washington—Cont'd.	°	°	°	*Ins.*	*Ins.*
Union City†	56	23	39.3	22.40	10.0
Vashon†	57	11	36.8	7.44	
Walla Walla					6.3
Waterville†	44	— 3	23.8	2.75	27.5
Wenatchee Lake†	40	0	25.9		20.0
West Ferndale†	57	18	38.6	4.63	5.0
West Virginia.					
Beverly†	54	0	32.7	1.63	6.8
Bloomery†	55	— 1	28.7	1.96	T.
Bluefield†	62	— 3	34.2	1.36	0.8
Buckhannon *a*†				2.55	4.0
Buckhannon *b*	55	— 4	32.1		
Burlington	57	1	29.6	1.60	1.0
Charleston†				1.05	
Dayton*[1]	58	4	34.6	1.39	
Elkhorn†	61	4	36.7	1.16	2.0
Ella†	51	0	30.4	1.93	2.5
Fairmont†				1.16	1.0
Glenville†	57	0	31.7	2.13	2.0
Grafton†	55	— 3	30.8	1.50	2.6
Green Sulphur	49	7	31.1	0.74	
Harpers Ferry†				1.94	
Hewett†	59	6	35.4	0.67	
Hinton *a*†				0.92	
Hinton *b*†	58	4	35.6		T.
Leachtown†				2.18	0.2
Marlinton†	53	— 3	29.1	1.45	1.1
Martinsburg†	60	5	31.2	1.60	
Morgantown *a*†				1.43	
Morgantown *b*†	51	— 1	31.0	0.96	0.9
New Martinsville†	52	5	32.6	1.91	
Nuttallburg†	59	— 5	32.1	1.80	4.0
Oldfields†	54	2	31.0	1.34	0.2
Parkersburg					1.0
Pennsboro	59	1	33.1	1.29	1.0
Point Pleasant†	56	3	34.2	1.59	
Powellton†	57	2	32.8	1.54	3.2
Rowlesburg†				1.65	5.0
Sandyville†	59	3	32.8	1.43	
Spencer†	50	2	32.0	1.70	1.0
Tannery*[1]	50	4	29.9		3.8
Weston *a*†				2.72	
Weston *b*[1]	60	2	33.7		T.
Wheeling *a*†				1.84	1.5
Wheeling *b*†	55	6	34.2	2.12	0.5
White Sulphur Springs	54	0	30.6		
Wisconsin.					
Amherst	47	—16	16.4	1.01	10.0
Antigo†	41	—24	15.4	0.99	9.9
Apollonia*†‡	38	—25	16.4	1.00	10.0
Barron†	40	—28	12.4	1.63	13.5
Bayfield	38	—15	15.4	0.70	7.0
Beloit	48	—13	24.2	0.41	4.5
Boscobel†	48	—12	20.6	1.05	9.0
Butternut†	37	—38	13.4	1.54	15.0
Centralia	43	—20	18.6	0.67	7.5
Chilton	47	—16	19.6	0.99	7.4
Citypoint	46			0.53	6.5
Crandon†	38	—30	8.8[e]	0.60	6.0
Delavan†	48	—14	23.2	0.59	5.2
Depere†	41	—16	18.4	1.38	11.0
Eau Claire	50	—24	13.4	1.40	10.5
Florence†	38	—26	15.0	0.92	10.6
Fond du Lac†	41	—17	19.2	0.94	6.0
Grantsburg†	48	—24	14.9	1.15	11.5
Grand River				1.32	8.0
Green Bay					8.3
Hartford				0.91	7.0
Harvey†	43	—13	22.2	1.16	8.4
Hayward†	39	—39	10.5	2.40	22.0
Hillsboro	51	—13	19.2	1.57	9.5
Koepenick*†‡	42	—26	14.6	1.25	10.5
La Crosse					5.7
Lancaster†	47	—14	19.2	0.89	6.0
Lincoln†[2]			23.8	1.42	11.5
Madison†	50	—13	21.6	0.85	4.8
Manitowoc†	49	—13	22.4	1.05	7.0
Meadow Valley†	53	—19	17.2	0.49	7.8
Medford†	46	—31	14.1		
Menasha				0.33	4.8
Milwaukee					8.4
Neillsville†	44	—25	15.4	1.16	8.0
New Holstein†	44	—19	16.3	0.78	5.0
Oconomowoc†	43	—14	22.7	0.64	4.5
Oconto	43	—14	20.2	1.90	16.0
Osceola†	43	—23	12.9	0.71	6.7

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Wisconsin—Cont'd.	°	°	°	*Ins.*	*Ins.*
Oshkosh†	44	—13	21.6	1.54	5.4
Pepin	49	—24	15.6	0.53	7.0
Pine River†	51	—17	20.5	0.62	7.5
Portage				1.14	7.0
Port Washington	50	—15	25.2	1.00	6.5
Prairie du Chien	49[e]	—19	20.7	0.50	5.0
Racine*[10]	46	—14	22.0		
Royalton	45	—17	18.2	1.21	9.5
Sharon†	50	—16	23.0	0.75	1.0
Shawano	45	—17	19.6	0.99	9.0
Spooner†	40	—32	11.4	0.40	4.0
Stevens Point†	49	—19	17.6	0.67	7.8
Sturgeon Bay Canal*[9]	37	—16	21.8		
Valley Junction†	51	—19	18.6	0.97	10.0
Viroqua	44	—17	19.6	0.94	9.5
Watertown†	45	—16	23.0	1.24	9.0
Waukesha†	47	—11	23.6	0.43	3.2
Waupaca				0.85	9.0
Wausau†	38	—20	15.7	1.02	9.0
Westbend	44	—12	21.6	1.02	5.2
Westfield†	45	—17	19.2	0.95	7.5
Whitehall†	49	—26	15.4	1.10	9.0
Wyoming.					
Bighorn Ranch†	56	—17	26.4	0.40	6.0
Cheyenne					6.8
Embar†				0.50	6.0
Fort Laramie†	60	—20	30.0	1.29	13.0
Fort Washakie	60	—20	26.0	0.25	2.5
Fort Yellowstone†	48	— 7	25.6	2.21	21.8
Lander (V. O.)	52	—15	27.4	0.40	4.0
Lander (W. B.)					2.4
Laramie	57	— 2	27.6	0.44	T.
Lusk†	57	—19	25.0	0.72	
Sheridan	56	—25	18.0	1.05	10.5
Sundance	46	—22	23.0	0.70	7.0
Wheatland†	59	—15	25.9	1.70	17.0
Mexico.					
Ciudad P. Diaz	86	22	55.2	1.11	
Leon de Aldamas	75	36	57.4	0.13	
Mexico	72	36	54.7	0.02	
Puebla	77	41	58.5	T.	
New Brunswick.					
St. John	40	—12	16.8	1.94	16.2
West Indies.					
Grand Turk Island				1.87	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

† Weather Bureau instruments.

‡ Record furnished by the Arrowhead Reservoir Company, in the San Bernardino Mountains, San Bernardino County, Cal., at elevations varying from 4,900 to 6,900 feet.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. ÷ 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[8] Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 3.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "*s*" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

NOTE.—The following change has been made: New Mexico, Pecos changed to Winsors Ranch.

TABLE III.—*Data from Canadian stations for the month of January, 1896.*

Stations.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.	Total depth of snow.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.		
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*		
St. Johns, N. F	29.70	29.85	+ .01	26.8	+ 3.2	10.38	.....	n.	46.0
Sydney, C. B. I	29.90	29.96	+ .06	34.0	+ 4.5	3.87	— 0.94	nw.	34.5
Halifax, N. S	29.94	30.08	+ .12	21.2	+ 0.2	1.73	— 3.96	ne.	14.6
Grand Manan, N. B.	30.05	30.10	.....	20.5	.....	1.45	— 3.92	nw.	11.9
Yarmouth, N. S.	30.00	30.08	+ .06	23.8	+ 1.7	1.97	— 3.25	nw.	17.8
St. Andrews, N. B.	.....	.....	.....	16.4	.....	0.56	— 2.74	nw.	5.6
Charlottet'n, P. E. I.	30.00	30.04	.....	18.6	.....	1.81	— 1.60	w.	16.9
Chatham, N. B	30.08	30.10	+ .08	9.6	+ 3.6	2.19	— 1.09	nw.	21.9
Father Point, Que.	30.14	30.17	+ .15	5.6	— 0.4	1.81	— 0.89	n.	18.1
Quebec, Que	29.83	30.19	+ .13	9.2	+ 2.2	1.10	— 2.57	ne.	11.0
Montreal, Que	29.97	30.20	+ .12	11.1	+ 1.1	2.08	— 1.20	nw.	20.8
Rockliffe, Ont.	29.63	30.18	+ .12	5.8	+ 2.3	1.50	— 0.51	se.	15.0
Kingston, Ont	29.84	30.18	+ .10	14.0	— 1.0	1.59	— 1.67	ne.	....
Toronto, Ont	29.76	30.17	+ .08	21.6	+ 2.6	3.93	+ 1.42	ne.	20.7
White River, Ont	28.70	30.16	.....	3.3	+ 4.7	3.19	+ 1.86	n.	31.7
Port Stanley, Ont	29.48	30.16	— .06	24.3	.....	1.38	— 1.30	w.	9.5
Saugeen, Ont	29.38	30.14	+ .06	21.2	+ 2.7	3.32	— 0.14	w.	30.3
Parry Sound, Ont	29.40	30.15	+ .07	12.8	+ 1.3	3.30	+ 0.15	e.	30.0
Port Arthur, Ont	29.39	30.14	+ .04	8.8	+ 8.3	0.55	— 0.26	w	5.5
Winnipeg, Man	29.31	30.23	+ .05	— 4.5	+ 6.5	1.03	+ 0.37	n.	9.9
Minnedosa, Man	28.20	30.19	+ .03	— 4.0	+ 7.5	1.37	+ 0.74	e.	13.4
Qu'Appelle, Assin.	27.72	30.19	+ .03	— 2.9	+ 5.1	0.66	+ 0.28	nw.	6.4
Medicine Hat, Assin	27.66	30.15	— .03	6.9	+ 5.4	1.38	+ 1.05	s.	13.8
Swift Curr't, Assin.	27.38	30.17	— .01	4.3	+ 6.3	0.72	+ 0.11	w.	7.2
Calgary, Alberta	26.26	30.08	— .10	1.9	— 1.6	0.90	+ 0.33	w.	9.0
Prince Albert, Sask.	28.56	30.25	.....	—11.0	.....	1.56	.....	e.	15.6
Edmonton, Alberta	27.64	30.21	+ .09	— 4.5	— 5.7	0.40	— 0.33	se.	4.0
Battleford, Sask	28.29	30.22	.....	— 9.3	... .	0.37	.....	se.	3.7
Spences Br'ge, B. C.	29.08	29.96	.....	23.4	.....	1.63	.....	ne.	10.7
Hamilton, Bermuda	29.92	30.06	— .05	60.3	.....	6.88	.....	nw.	....
Banff, Alberta	.....	.....	.....	9.5	.....	1.40	.....	sw.	....
Esquimalt, B. C	29.81	29.84	... .	38.0	.....	8.23	.....	n.	16.9

TABLE IV.—*Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.*

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, —0.06, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

January, 1896.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1	29.95	29.80	29.86	64	76	65	77	62	74	90	6.0	n-s.	1	1	0.08
2	30.00	29.93	29.97	64	77	71	78	62	77	81	6.4	n-s.	1	1	0.00
3	30.00	29.93	30.04	70	77	69	79	70	90	90	7.6	w-sw.	2	3-1	0.23
4	30.05	29.97	30.05	65	76	69	78	65	80	87	6.8	sw.	2	1-5	0.00
5	30.06	29.95	30.03	71	74	72	76	67	93	95	8.2	sw-w.	1	10	0.01
6	30.05	29.98	30.07	70	78	65	78	70	90	90	7.5	w-n.	3	4-0	0.25
7	30.07	29.98	30.06	67	76	67	78	62	70	90	6.2	sw.	1	3	0.05
8	30.09	29.98	30.06	67	77	71	79	64	77	66	6.3	w-ne.	2	4	0.01
9	30.06	29.97	30.04	71	77	65	79	69	67	85	5.9	e-s.	1	2	0.01
10	30.02	29.95	29.99	64	76	67	77	63	77	88	6.7	s.	1	2	0.00
11	29.98	29.89	29.97	65	77	69	77	65	77	87	6.8	sw.	2	3-10	0.00
12	30.03	29.94	30.06	63	76	67	77	63	75	65	5.8	n.	2	1	0.02
13	30.10	29.99	30.05	60	75	62	76	57	60	78	5.0	s.	1	1-0	0.00
14	30.05	30.00	30.03	59	73	63	75	58	79	83	5.5	sw.	1	1	0.00
15	29.97	29.86	29.93	61	76	70	78	60	81	95	6.4	sw.	1	0-8	0.00
16	29.93	29.87	29.96	67	73	68	77	67	95	97	7.3	sw.	1	10	0.24
17	29.97	29.87	29.92	68	77	74	78	64	79	80	7.3	sw.	1	5	0.15
18	29.93	29.86	29.94	74	79	76	80	74	77	87	7.9	sw.	4	3-10	0.00
19	29.98	29.92	30.04	71	77	69	78	71	85	90	7.8	sw.	1	10-7	0.15
20	30.10	30.04	30.12	64	76	70	79	64	76	84	6.6	sw-n.	1-0	7	0.08
21	30.14	30.08	30.10	67	77	73	79	67	90	90	7.2	s-e.	1	*	0.08
22	30.08	29.92	29.99	69	78	75	78	67	86	90	8.1	s.	1	10-2	0.08
23	30.00	29.93	30.03	68	78	69	79	68	87	90	7.6	sw.	1	3	0.30
24	30.04	29.94	30.01	65	77	69	79	65	77	90	7.1	sw.	1	2	0.00
25	30.02	29.90	29.99	62	77	66	78	62	74	90	6.3	sw.	2-0	1	0.00
26	30.03	29.96	30.04	62	78	67	79	62	74	76	6.3	sw.	1	1-0	0.00
27	30.06	30.02	30.10	63	77	72	80	63	63	77	6.6	n-s-e.	1-0	0-5	0.00
28	30.11	30.02	30.06	70	79	75	80	68	78	70	7.1	s.	1	9	0.01
29	30.04	29.91	30.02	74	77	75	78	73	77	87	7.7	s.	4-1	10	0.00
30	30.10	30.02	30.14	65	73	69	75	65	76	63	5.7	nne.	2-5	10-3	0.78
31	30.17	30.09	30.20	68	74	69	75	67	67	80	6.0	nne.	6-4	3	0.00
	30.04	29.95	30.03	66.4	76.4	69.3	77.9	65.4	78.3	84.2	6.8	.....	1.6	4.3	2.38

* 10-2-10.

Mean temperature: 6+2+9+3 is 70.7; the normal is 70.0; extreme temperatures, 80° and 57°. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.

Slight earthquake at 2.45 a. m. on the 23d.

Southerly winds prevailed the entire month, more than normal.

Sudden change to north with strong wind on the night of 29th, barometer rose from 30.00 to 30.20.

Storm periods for the month 8, 16-20th and 31st.

TABLE V.—*Mean temperature for each hour of seventy-fifth meridian time, January, 1896.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N Dak	5.3	4.8	4.7	4.7	4.7	5.1	4.9	4.9	4.2	4.9	6.1	8.1	10.0	12.1	13.0	13.5	13.1	11.9	9.8	8.7	7.5	6.6	6.0	5.2	7.5
Boston, Mass	23.4	22.9	23.1	22.6	22.4	21.7	21.7	22.0	22.4	23.8	25.2	26.8	27.8	28.6	29.0	28.5	27.9	27.3	26.8	26.2	25.6	25.0	24.4	23.8	25.0
Buffalo N Y	24.3	24.2	23.9	24.1	24.0	24.0	24.2	24.1	24.4	25.1	26.1	26.7	26.9	27.1	27.5	27.6	27.2	26.7	26.3	26.0	25.7	25.5	25.2	25.0	25.5
Chicago, Ill	26.0	25.5	25.3	25.1	24.8	24.6	24.5	24.8	24.7	25.3	26.3	27.5	28.3	28.6	28.9	29.5	29.5	29.4	29.0	28.8	28.2	28.0	27.7	27.4	27.0
Cincinnati, Ohio	32.3	32.1	31.6	31.2	30.8	30.4	30.5	30.5	30.6	31.1	32.2	33.5	34.7	35.6	36.6	37.1	37.0	36.6	36.1	35.6	35.0	34.4	34.0	33.7	33.5
Cleveland, Ohio	26.6	26.8	26.7	26.4	26.5	26.2	26.1	26.2	26.5	27.4	28.6	29.5	30.0	30.4	30.4	30.0	29.7	29.2	28.7	28.2	27.9	27.9	27.9	27.5	28.0
Detroit, Mich	24.5	24.6	24.6	24.4	24.1	23.9	23.7	23.7	24.0	25.1	26.0	26.6	27.1	27.5	27.5	27.6	27.4	27.1	26.7	26.7	26.5	26.2	25.7	25.6	26.7
Dodge City, Kans	31.2	30.2	29.7	29.5	28.6	27.8	27.3	27.3	27.3	28.4	32.8	37.3	41.5	44.0	45.8	46.7	46.5	45.4	41.6	38.0	36.3	34.5	33.2	32.6	35.1
Eastport, Me	18.6	18.0	17.7	17.4	17.0	16.6	15.9	15.9	16.6	17.6	18.7	20.0	21.1	21.4	21.5	21.2	20.7	20.3	19.8	19.7	19.5	19.1	18.8	18.2	18.8
Galveston, Tex	52.7	52.5	52.5	52.1	51.8	51.5	51.2	50.7	50.9	51.3	52.0	52.9	54.0	54.6	54.9	55.2	55.0	54.9	54.3	54.1	54.0	53.8	53.7	53.5	53.1
Havre, Mont	8.0	8.5	8.1	7.6	8.5	7.7	7.3	6.1	5.2	4.7	4.5	5.9	7.9	9.1	10.6	11.4	11.3	11.3	9.7	9.0	8.1	9.0	9.4	8.9	8.2
Kansas City, Mo*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Key West, Fla	65.2	65.1	65.0	65.0	64.9	64.8	64.7	64.9	65.6	66.6	67.2	68.1	68.1	68.0	68.0	67.5	67.1	66.5	66.2	66.1	65.7	65.7	65.6	65.6	66.1
Memphis, Tenn	41.4	40.6	39.7	39.3	38.8	38.4	37.8	37.4	37.4	37.9	39.0	40.6	41.8	43.2	44.2	45.0	45.6	45.7	45.3	44.6	44.2	43.7	43.1	42.7	41.5
New Orleans, La	49.5	49.3	49.0	48.7	48.3	48.0	47.8	47.8	48.0	49.1	51.1	53.3	54.8	55.8	56.5	56.9	57.0	56.6	54.9	53.2	52.3	51.7	51.0	50.6	51.7
New York, N Y	26.0	25.8	25.5	25.3	25.1	24.9	25.1	24.9	25.2	26.2	27.6	28.4	29.7	30.1	30.8	30.6	30.1	29.7	29.1	28.2	27.5	27.1	26.9	26.6	27.3
Philadelphia, Pa	29.4	29.0	28.8	28.6	28.5	28.0	27.8	28.0	28.5	29.7	31.3	32.4	33.5	34.1	34.3	34.2	33.5	32.8	32.2	32.1	31.0	30.6	30.1	29.8	30.8
Pittsburg, Pa	29.8	29.5	29.1	28.9	28.8	28.9	29.0	29.2	29.8	30.7	32.0	33.1	34.3	34.9	35.3	35.4	35.0	34.3	33.7	32.9	32.2	31.8	31.3	31.0	31.7
Portland, Oreg	40.6	40.7	40.2	40.2	40.0	39.9	39.6	39.8	39.7	40.1	40.3	41.0	42.2	42.8	43.7	43.7	44.4	44.0	43.5	43.1	42.3	41.9	41.0	40.8	41.5
St. Louis, Mo	33.2	32.7	32.3	31.8	31.4	31.1	30.8	30.6	30.7	31.3	33.0	35.4	36.9	38.3	39.3	40.1	39.9	39.2	38.5	37.5	36.8	35.8	35.0	34.5	34.8
St. Paul, Minn	14.5	13.9	13.4	12.7	12.5	12.2	12.3	12.2	12.0	12.5	14.3	16.6	18.3	19.4	20.7	21.4	21.2	20.5	19.3	18.7	17.9	17.2	16.3	15.8	16.1
Salt Lake City, Utah	31.7	31.5	31.5	31.2	31.3	30.9	30.7	30.9	30.1	30.5	31.0	33.2	35.5	37.0	38.3	38.5	38.9	38.7	37.9	35.8	34.8	34.1	33.2	32.5	33.7
San Diego, Cal	52.6	52.6	51.8	51.4	51.3	51.2	51.1	50.6	50.3	49.9	52.4	55.5	58.5	60.3	61.1	61.5	61.4	61.5	60.3	58.4	56.6	55.1	54.2	53.3	55.1
San Francisco, Cal	51.8	51.8	51.2	51.1	50.6	50.1	50.0	49.7	49.6	49.7	49.9	50.4	51.1	52.3	53.1	54.2	55.4	55.5	54.5	53.7	53.2	53.1	52.7	52.5	52.0
Savannah, Ga	44.8	44.2	43.8	43.6	43.4	43.0	42.8	43.4	45.4	48.8	51.7	53.9	54.6	55.5	55.9	55.3	53.5	51.6	50.5	49.7	48.4	47.3	46.6	45.9	48.5
Washington, D. C	30.7	30.4	30.0	29.7	29.4	29.4	29.3	29.6	30.9	32.8	34.2	35.4	36.5	38.0	38.0	38.1	37.4	36.2	34.9	33.9	33.1	32.4	31.4	31.2	33.0

*Record incomplete.

TABLE VI.—*Mean pressure for each hour of seventy-fifth meridian time, January, 1896.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N. Dak	28.302	.291	.287	.287	.287	.286	.286	.285	.292	.298	.304	.310	.302	.280	.272	.274	.284	.297	.310	.315	.312	.315	.316	.318	.296
Boston, Mass	29.995	.002	.003	.001	.001	.013	.022	.035	.044	.044	.031	.011	.995	.990	.996	.998	.004	.010	.016	.016*	.019	.019	.021	.018	.013
Buffalo, N. Y	29.360	.363	.365	.359	.353	.357	.365	.371	.385	.391	.390	.375	.358	.352	.356	.364	.368	.376	.383	.381	.381	.382	.379	.374	.370
Chicago, Ill	29.225	.234	.232	.230	.228	.227	.233	.243	.250	.257	.261	.253	.234	.214	.205	.202	.205	.214	.218	.225	.229	.228	.231	.228	.229
Cincinnati, Ohio	29.493	.498	.500	.499	.496	.499	.509	.518	.530	.539	.538	.528	.506	.490	.487	.486	.486	.490	.497	.499	.502	.504	.502	.496	.504
Cleveland, Ohio	29.328	.329	.336	.335	.332	.329	.339	.343	.346	.351	.351	.337	.317	.307	.309	.316	.323	.329	.333	.338	.333	.333	.335	.331	.332
Detroit, Mich	29.337	.336	.340	.339	.335	.337	.343	.349	.355	.363	.367	.359	.337	.327	.324	.328	.333	.337	.346	.348	.348	.348	.348	.345	.343
Dodge City, Kans	27.462	.455	.450	.454	.452	.446	.443	.449	.455	.462	.474	.479	.471	.445	.425	.420	.427	.429	.435	.445	.454	.460	.464	.465	.451
Eastport, Me	29.974	.977	.975	.972	.974	.985	.004	.023	.034	.033	.015	.999	.988	.984	.986	.989	.997	.007	.017	.020	.018	.015	.007	.002	.000
Galveston, Tex	30.149	.141	.139	.133	.132	.134	.138	.154	.171	.183	.190	.180	.157	.138	.111	.102	.102	.106	.110	.116	.126	.134	.136	.137	.138
Havre, Mont	27.335	.336	.339	.336	.345	.347	.349	.353	.368	.385	.395	.401	.405	.385	.366	.352	.348	.347	.343	.342	.343	.344	.345	.347	.356
Kansas City, Mo	29.126	.122	.125	.127	.124	.119	.124	.129	.135	.144	.156	.163	.140	.116	.102	.101	.103	.104	.108	.117	.121	.126	.124	.127	.124
Key West, Fla	30.137	.129	.122	.118	.115	.119	.133	.149	.167	.176	.174	.155	.130	.110	.101	.100	.103	.111	.119	.131	.140	.145	.146	.141	.132
Memphis, Tenn	29.742	.742	.745	.745	.740	.742	.749	.760	.772	.780	.789	.788	.762	.730	.714	.706	.705	.708	.716	.721	.725	.728	.733	.732	.740
New Orleans, La	30.130	.127	.126	.124	.122	.121	.130	.144	.158	.170	.174	.164	.132	.105	.096	.090	.092	.096	.104	.115	.122	.128	.130	.127	.126
New York, N. Y	29.816	.817	.817	.813	.812	.812	.821	.833	.844	.846	.835	.818	.800	.792	.794	.796	.804	.813	.825	.833	.835	.836	.837	.834	.820
Philadelphia, Pa	30.055	.061	.061	.056	.057	.061	.071	.079	.087	.094	.084	.064	.049	.040	.039	.037	.045	.055	.064	.069	.078	.075	.072	.068	.063
Pittsburg, Pa	29.245	.244	.247	.246	.244	.245	.251	.264	.270	.278	.275	.261	.241	.231	.231	.237	.242	.249	.255	.260	.260	.258	.254	.252	.252
Portland, Oreg	29.778	.779	.772	.767	.769	.768	.760	.756	.753	.755	.762	.774	.784	.787	.773	.765	.763	.766	.765	.763	.765	.768	.771	.774	.768
St. Louis, Mo	29.558	.551	.554	.553	.550	.551	.557	.563	.573	.581	.586	.579	.554	.535	.521	.594	.526	.530	.537	.543	.549	.553	.556	.557	.552
St. Paul, Minn	29.211	.216	.222	.225	.228	.219	.216	.215	.214	.219	.220	.220	.204	.185	.176	.179	.185	.195	.201	.207	.210	.213	.213	.215	.208
Salt Lake City, Utah	25.708	.707	.708	.705	.708	.702	.699	.701	.707	.714	.720	.728	.727	.716	.699	.688	.682	.686	.686	.691	.697	.701	.703	.708	.704
San Diego, Cal	30.011	.010	.008	.003	.000	.997	.990	.999	.000	.005	.024	.035	.039	.031	.005	.984	.969	.967	.969	.975	.988	.995	.006	.009	.000
San Francisco, Cal	29.925	.925	.919	.913	.914	.912	.904	.909	.904	.912	.918	.932	.945	.946	.928	.910	.896	.894	.896	.893	.897	.901	.906	.914	.913
Savannah, Ga	30.085	.084	.085	.082	.078	.087	.100	.110	.120	.127	.125	.105	.081	.063	.054	.054	.057	.063	.075	.081	.086	.093	.093	.089	.086
Washington, D. C	30.079	.077	.081	.078	.078	.082	.090	.099	.113	.121	.118	.102	.082	.066	.061	.061	.066	.076	.087	.093	.098	.097	.097	.093	.087

TABLE VII.—*Average wind movement for each hour of seventy-fifth meridian time, January*, 1896.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	7.1	7.5	7.4	7.1	7.3	7.4	7.1	7.2	7.1	7.4	8.5	10.1	11.9	11.6	11.7	10.7	10.2	9.5	7.9	6.5	6.4	6.3	6.6	7.2	8.2
Albany, N. Y.	6.0	5.9	6.0	6.2	6.1	6.0	6.3	6.2	6.4	7.0	8.1	8.4	9.2	9.6	10.1	9.9	9.0	8.6	8.2	7.5	7.4	7.0	6.9	6.5	7.4
Alpena, Mich.	9.0	8.8	9.0	8.5	8.6	8.9	8.7	8.7	8.8	9.6	10.5	11.0	10.7	10.7	10.4	9.9	10.0	9.2	9.5	7.5	7.7	7.3	9.5	9.2	9.5
Amarillo, Tex.	15.8	16.5	16.2	16.1	16.3	16.1	15.4	14.7	14.2	13.6	13.8	14.5	14.6	15.3	15.9	16.2	16.5	15.5	13.4	13.6	14.3	14.7	16.3	15.4	15.2
Atlanta, Ga.	10.5	10.8	10.6	10.1	10.3	10.5	10.3	10.5	9.7	10.1	10.6	10.5	11.1	11.5	11.2	10.9	10.7	9.5	8.6	9.0	9.4	9.8	10.4	10.6	10.3
Augusta, Ga.	3.8	4.1	4.4	4.4	4.9	4.5	4.2	4.4	5.1	5.6	6.3	6.5	7.6	7.7	7.3	7.4	6.7	6.2	5.1	4.5	3.9	4.2	3.4	3.2	5.2
Baker City, Oreg.	6.1	5.6	5.0	5.7	6.0	6.1	6.2	6.6	6.0	6.7	7.9	7.2	7.1	7.6	6.9	6.8	6.7	6.0	6.1	5.7	6.0	5.8	6.0	6.4	6.3
Baltimore, Md.	8.2	7.8	7.3	7.3	7.3	7.8	8.0	8.2	8.8	9.7	10.6	10.1	9.5	10.0	10.2	9.9	8.9	7.9	7.6	7.4	7.5	7.7	7.6	7.6	8.5
Bismarck, N. Dak.	9.7	9.2	8.6	8.0	7.3	7.8	7.0	7.5	7.5	8.2	8.5	8.3	10.1	10.5	11.7	12.6	12.3	12.3	10.8	9.7	8.7	9.0	9.3	9.4	9.3
Block Island, R. I.	20.7	20.7	20.5	20.7	20.5	20.7	20.5	20.6	21.5	21.6	21.3	20.6	20.6	20.9	20.7	20.6	19.6	19.2	19.8	19.4	20.0	20.4	21.4	21.1	20.6
Boston, Mass.	12.4	12.6	12.7	12.1	12.1	12.1	12.5	12.4	12.6	12.7	12.9	12.7	12.9	13.5	13.0	13.3	12.8	11.6	11.4	11.8	11.8	11.8	11.6	12.0	12.4
Buffalo, N. Y.	10.0	9.0	9.3	9.2	9.1	9.2	9.2	8.9	9.0	9.2	9.2	9.3	9.4	9.7	10.0	10.2	10.1	9.9	9.7	9.2	9.3	8.5	8.0	9.4	9.3
Cairo, Ill.	7.6	8.1	8.1	7.8	7.9	7.3	7.6	7.2	7.3	7.3	8.0	7.9	8.2	8.7	9.0	8.8	8.1	8.2	7.8	7.8	7.6	7.5	7.8	7.5	7.9
Cape Henry, Va.	12.6	13.1	14.3	15.3	15.7	15.5	16.0	15.7	14.9	14.3	14.3	13.7	13.8	13.4	12.6	12.2	11.5	11.5	12.3	12.9	11.8	12.5	12.1	11.8	13.5
Charleston, S. C.	7.3	7.0	6.3	6.9	6.7	6.6	7.3	7.4	7.6	8.1	8.5	8.4	8.5	8.7	9.5	7.1	8.5	6.4	6.5	7.2	7.2	7.5	7.4	6.8	7.6
Charlotte, N. C.	6.3	6.5	6.6	6.4	6.1	5.9	6.2	6.3	6.8	7.4	7.9	8.5	8.2	8.4	7.6	7.5	6.9	6.0	5.6	6.1	6.5	6.4	6.5	6.3	6.8
Chattanooga, Tenn.	7.1	6.6	6.5	6.0	6.0	5.6	5.3	5.2	5.4	6.0	7.2	6.7	7.4	8.4	7.8	8.1	8.5	7.5	7.5	7.6	6.8	6.8	7.0	6.9	6.8
Cheyenne, Wyo.	11.2	10.0	9.9	9.8	10.5	10.8	11.5	10.6	10.2	11.1	11.6	13.5	15.0	16.6	18.0	17.4	17.9	15.6	13.0	11.6	10.3	10.4	10.5	10.3	12.4
Chicago, Ill.	16.0	16.5	15.9	15.4	14.8	14.5	14.8	14.8	15.3	15.7	15.8	15.1	15.8	15.3	15.1	15.3	15.8	15.6	16.4	17.0	17.4	17.2	16.6	16.0	15.8
Cincinnati, Ohio.	7.8	7.8	7.5	7.7	7.1	7.1	6.9	7.3	7.9	8.3	8.6	8.7	9.1	8.7	8.5	8.4	7.8	8.5	7.8	7.4	7.6	7.5	7.5	7.2	7.8
Cleveland, Ohio	13.7	13.1	13.0	12.7	11.7	11.4	11.9	11.8	12.4	13.2	13.6	14.1	14.6	14.7	14.7	14.6	14.1	13.0	12.0	12.3	12.8	12.6	12.7	13.1	13.1
Columbia, Mo.	8.2	7.9	7.8	7.8	8.2	8.1	8.5	7.7	8.0	8.3	9.2	9.8	9.9	10.4	11.1	10.7	9.6	8.5	8.0	8.2	8.4	8.5	8.5	8.1	8.7
Columbus, Ohio	6.1	6.2	6.5	6.1	6.1	6.3	5.7	6.0	6.5	6.9	7.5	7.4	8.0	7.6	7.4	7.7	7.3	6.6	6.3	6.8	6.7	6.6	6.7	6.1	6.7
Concordia, Kans.	5.7	5.9	5.9	6.3	6.7	6.9	6.4	6.6	6.4	6.6	6.6	8.0	8.0	7.7	8.1	8.0	7.6	6.5	6.5	5.7	5.1	5.4	5.5	5.7	6.6
Corpus Christi, Tex.	9.7	8.8	8.7	8.3	7.9	8.3	8.4	8.6	8.8	9.6	10.5	10.7	10.7	10.8	11.1	11.5	11.6	11.5	11.1	9.8	9.7	9.7	9.5	9.0	9.5
Davenport, Iowa.	8.1	7.6	7.3	7.4	7.6	7.9	8.2	7.9	7.8	8.5	10.0	10.7	10.9	11.0	11.6	11.8	11.5	10.8	9.8	9.7	8.6	9.4	9.2	8.8	9.3
Denver, Colo.	7.5	7.6	7.7	7.7	7.5	7.9	7.9	8.2	9.0	8.7	9.2	9.2	8.4	8.7	9.0	10.0	10.9	10.2	9.5	9.6	8.4	7.6	7.5	6.8	8.6
Des Moines, Iowa.	6.7	6.3	6.7	6.9	7.0	7.1	7.5	7.1	8.1	7.8	9.2	8.7	8.7	8.6	8.8	10.0	10.5	7.8	7.1	6.9	6.8	6.8	6.8	6.4	7.5
Detroit, Mich.	9.5	9.6	9.5	9.2	9.8	9.9	9.8	9.7	9.5	9.3	11.0	11.2	12.2	12.4	12.4	11.9	11.5	11.1	10.4	9.8	8.1	9.7	10.2	9.5	10.4
Dodge City, Kans.	8.5	9 2	9.5	9.9	9.8	8.9	9.2	10.0	9.5	9.3	11.1	11.2	10.7	11.4	11.4	11.4	11.5	11.6	10.8	10.0	8.0	8.0	7.9	6.7	9.6
Duluth, Minn.	10.2	10.7	9.5	8.5	8.5	7.4	7.7	8.1	8.6	8.1	9.0	8.3	7.8	8.3	8.3	8.3	8.3	7.6	7.1	7.6	8.8	9.6	9.0	9.2	9.8	8.6
Eastport, Me.	16.1	15.7	15.6	15.7	16.2	16.6	16.2	15.9	16.3	16.1	15.8	15.6	14.4	14.3	14.3	14.1	13.7	14.4	15.1	14.9	15.1	15.8	16.1	16.5	16.2	15.5
El Paso, Tex.	9.5	9.0	9.1	7.6	8.0	7.9	8.4	8.7	10.8	10.8	10.0	10.0	11.5	12.3	12.5	12.8	13.7	12.8	12.3	10.9	9.9	9.4	8.0	9.5	10.6	9.9
Erie Pa.	11.3	11.3	10.9	10.2	10.2	10.7	10.5	10.5	10.8	11.4	11.4	11.4	11.5	11.4	11.8	12.5	12.8	11.0	10.9	9.6	9.8	11.1	11.2	10.6	10.6	10.8
Eureka, Cal.	6.3	6.9	6.4	6.6	6.7	6.7	6.6	7.3	7.3	7.4	7.0	7.2	7.1	7.7	7.7	7.0	8.3	8.6	9.0	8.4	7.9	7.2	7.2	6.7	6.5	7.3
Fort Canby, Wash.	21.5	22.3	22.6	23.7	23.8	23.5	23.2	22.4	21.5	22.6	23.0	21.7	21.9	23.0	23.2	24.4	24.2	22.1	23.1	22.8	21.5	22.5	22.9	23.0	22.8
Fort Smith, Ark.	5.5	5.3	5.5	5.5	5.4	5.6	5.7	5.7	6.0	6.7	7.2	6.9	7.3	7.5	7.5	7.5	7.6	7.4	6.6	6.6	5.5	5.2	5.4	5.6	6.3
Fresno, Cal.	4.8	4.9	4.9	5.4	5.2	5.2	5.2	4.0	4.5	4.3	5.2	4.9	5.5	5.5	5.5	5.3	5.3	5.3	5.8	4.9	4.6	4.6	4.9	4.6	4.6	5.0
Galveston, Tex.	11.0	10.5	10.4	10.5	10.2	10.2	10.0	10.5	10.4	10.0	9.9	10.0	11.2	11.5	11.2	11.6	12.1	12.1	12.0	11.5	11.1	11.7	11.7	11.7	11.4	11.0
Grand Haven, Mich.	11.3	11.2	10.9	11.1	11.2	10.8	10.5	11.1	10.5	10.3	10.5	11.3	11.6	11.8	11.2	11.3	11.3	11.2	10.8	11.1	11.1	11.6	11.5	11.7	11.1	11.1
Green Bay, Wis.	7.9	7.7	7.5	8.2	8.2	7.6	7.1	7.8	8.0	7.9	8.2	8.5	9.0	9.4	9.2	9.4	8.9	7.9	7.5	8.2	8.4	8.4	8.4	8.5	8.6	8.3
Hannibal, Mo.	7.9	7.4	7.7	7.7	8.0	6.9	7.6	7.3	8.3	8.3	8.3	9.8	10.5	9.0	10.8	11.0	10.4	9.0	7.8	7.1	6.8	7.5	7.3	7.5	7.7	8.4
Harrisburg, Pa.	7.8	7.7	15.0	15.1	15.6	8.2	7.6	16.0	16.0	15.7	15.6	16.0	15.7	15.8	16.1	15.8	15.4	14.6	14.5	13.9	13.6	14.1	14.3	13.8	13.8	8.0
Hatteras, N. C.	15.4	15.1	9.6	9.5	9.5	9.7	16.3	9.1	10.1	10.3	9.4	9.0	9.3	9.0	8.6	8.5	9.1	8.9	7.9	7.6	8.2	8.0	8.4	9.9	10.2	15.2
Havre, Mont.	9.2	9.6																								9.1
Helena, Mont.	6.2	6.0	6.4	7.8	7.5	7.1	6.0	5.4	6.3	5.4	5.6	4.9	5.9	6.2	6.5	6.0	5.8	5.2	5.5	5.7	6.7	7.4	6.6	6.2	6.2
Huron, S. Dak.	12.5	12.3	13.0	12.0	12.8	13.2	13.1	12.3	12.6	12.2	13.0	13.3	13.5	14.2	14.6	13.6	12.8	12.7	12.0	11.4	11.4	12.5	12.7	12.6	12.6
Idaho Falls, Idaho*	10.3	9.7	9.1	9.1	9.9	9.9	10.6	10.1	10.3	10.8	9.5	9.6	10.7	10.9	11.1	10.9	10.9	9.8	10.4	9.5	8.3	9.8	9.5	8.9	9.9
Independence, Cal.	6.5	6.4	6.6	6.5	6.5	7.4	6.4	6.1	6.7	7.4	7.7	7.7	7.7	7.5	8.1	8.1	7.0	6.5	7.1	7.9	7.3	6.7	6.9	6.5	7.0	7.0
Indianapolis, Ind.	6.4	5.9	5.8	5.5	5.2	5.1	5.5	5.5	5.9	6.2	6.5	6.5	6.5	6.4	6.7	6.7	6.6	6.1	5.7	5.7	5.8	5.6	6.0	6.0	6.2	6.0
Jacksonville, Fla.	4.9	5.0	4.8	5.5	5.3	6.0	5.9	5.4	5.8	6.4	6.9	7.0	7.0	7.6	7.6	8.2	8.3	8.1	7.3	5.5	5.1	4.7	4.6	4.7	4.6	4.6
Jupiter, Fla.	8.6	9.0	7.8	8.2	8.6	8.8	8.1	7.3	8.6	8.9	10.2	11.5	11.9	12.1	12.2	12.0	11.7	10.5	8.8	8.3	8.1	7.7	8.9	8.9	8.9	9.5
Kansas City, Mo.	6.8	6.7	6.9	6.5	6.9	7.1	7.3	8.0	6.7	8.4	8.5	9.2	9.4	9.0	8.5	8.2	8.8	9.0	8.1	7.2	7.5	7.5	7.2	7.2	7.1	7.8
Keokuk, Iowa	6.6	6.8	5.7	6.1	6.1	6.1	6.4	9.7	6.7	6.7	7.0	8.0	8.3	8.5	9.1	9.2	9.2	8.5	7.8	7.0	6.8	6.2	6.2	6.5	6.6	7.2
Key West, Fla.	10.4	10.7	10.6	10.5	10.4	10.3	9.7	10.0	9.9	10.5	11.3	11.5	11.5	11.5	11.2	11.0	11.1	10.9	10.9	10.1	10.4	10.8	10.9	10.1	10.1	10.6
Kittyhawk, N. C.	14.1	14.4	14.5	15.1	15.1	15.8	16.3	16.4	17.0	18.0	17.5	17.5	17.5	17.2	16.7	16.7	16.2	15.4	14.9	14.0	14.4	15.2	14.8	13.7	14.0	15.6
Knoxville, Tenn.	3.4	3.8	4.1	3.9	4.1	4.1	4.0	4.3	4.4	5.3	6.3	6.3	6.8	7.4	7.8	7.8	6.7	6.3	5.2	5.0	4.3	4.3	4.2	3.8	3.8	5.0
La Crosse, Wis.	5.8	5.6	6.1	6.1	5.8	5.9	5.9	6.1	6.2	6.3	6.3	6.8	7.1	7.5	7.8	8.3	7.3	7.2	6.3	6.8	6.4	6.2	6.2	5.8	5.5	6.5
Lander, Wyo.	3.9	4.0	3.7	3.4	2.7	3.0	3.0	3.2	3.3	3.1	2.7	2.6	2.6	2.4	3.9	3.8	3.7	3.4	3.5	3.4	3.2	3.1	2.8	2.8	2.5	3.2
Lexington, Ky.	11.9	11.4	11.1	11.4	11.6	11.9	11.7	11.5	11.7	11.7	12.0	12.5	12.2	12.2	11.8	12.1	11.4	11.4	10.7	10.5	10.6	11.6	11.7	11.2	11.4	11.3
Little Rock, Ark.	6.3	5.8	6.1	5.9	5.9	5.9	6.2	5.9	6.3	6.9	7.7	8.2	8.3	8.3	8.2	8.1	7.5	6.9	7.3	8.5	8.6	8.9	9.3	9.0	9.2	9.3
Los Angeles, Cal.	3.0	3.4	3.2	3.2	3.1	3.3	3.2	3.2	3.4	3.2	3.3	3.8	4.0	4.0	4.3	3.4	3.8	4.8	3.9	5.3	5.3	5.0	5.1	5.2	4.7	5.2
Louisville, Ky.	8.0	8.0	8.1	8.0	7.3	7.5	7.2	7.4	7.5	7.5	7.7	8.4	8.4	8.4	8.3	8.3	8.3	8.4	8.5	8.5	8.1	8.1	8.3	8.2	8.3	8.4
Lynchburg, Va.	3.2	2.9	2.6	3.0	2.9	3.0	3.0	2.9	3.3	3.3	3.6	3.6	3.7	3.8	4.0	4.3	3.4	3.9	4.7	5.1	5.1	4.9	4.7	5.2	5.3	5.3
Marquette, Mich.	10.4	10.5	9.6	9.5	9.6	9.6	10.0	10.1	10.5	10.7	10.9	11.0	11.0	11.4	11.8	12.1	11.7	10.9	10.3	9.2	9.3	10.8	11.3	11.3	10.9	10.8
Memphis, Tenn.	9.7	9.4	9.4	9.8	9.8	9.2	9.6	9.3	9.3	9.4	9.3	9.4	9.6	9.4	10.1	9.6	9.3	8.5	8.9	8.5	8.6	8.9	9.3	9.0	9.2	9.1
Meridian, Miss.	4.6	4.6	3.9	4.1	3.8	4.5	4.1	4.1	4.3	5.3	5.8	6.3	6.7	7.7	6.3	6.8	6.7	6.9	6.6	5.9	5.3	5.0	5.1	5.2	4.7	4.7
Miles City, Mont.	6.0	5.5	5.3	5.6	5.6	5.7	6.4	5.7	6.1	6.5	6.8	7.6	7.6	8.4	7.6	8.4	7.5	6.9	7.3	7.5	5.1	4.9	4.7	5.2	5.3	5.0
Milwaukee, Wis.	11.0	10.5	10.3	10.2	9.9	10.0	9.9	9.9	9.9	10.0	10.6	11.0	11.9	11.6	11.7	11.5	11.5	11.5	11.2	11.1	11.1	10.8	11.3	11.3	10.9	10.8
Mobile, Ala.	6.4	6.4	6.4	6.0	6.0	6.5	6.1	6.2	6.1	6.4	6.7	6.8	7.6	8.5	8.9	9.3	9.2	8.2	7.6	7.6	7.2	7.2	6.9	6.4	6.5	7.0
Montgomery, Ala.	5.9	6.2	6.2	5.8	5.7	4.8	4.6	4.7	5.4	6.5	6.8	7.2	7.2	7.2	7.2	7.1	7.3	7.6	7.2	6.5	6.6	6.9	6.6	6.7	6.3	6.4
Moorhead, Minn.	9.9	9.6	9.6	10.2	10.1	11.0	10.9	11.1	11.3	10.5	11.2	12.3	12.6	12.9	12.9	12.9	12.7	11.9	11.7	11.5	10.6	10.3	10.0	9.9	9.6	9.6
Nantucket, Mass.	13.9	14.3	14.1	13.9	13.7	13.5	13.5	14.0	14.3	14.5	14.9	15.1	15.2	15.1	15.2	15.0	14.5	14.3	14.8	14.2	14.2	13.9	13.7	13.6	13.3	13.1
Nashville, Tenn.	5.8	6.1	5.8	5.4	5.4	6.2	6.1	5.8	5.9	6.4	6.9	6.8	7.1	7.2	7.1	7.2	7.5	8.1	7.6	7.6	6.8	6.4	6.1	5.8	6.4	5.9
New Haven, Conn.	9.5	9.5	9.8	9.8	9.8	9.5	9.9	10.1	10.5	11.3	12.7	12.3	12.7	12.8	13.1	12.7	12.0	10.7	10.0	10.8	10.8	9.5	9.2	8.9	9.2	8.6
New Orleans, La.	8.1	8.2	7.8	8.1	8.0	8.1	8.5	8.5	8.0	8.7	8.8	9.4	9.8	10.1	10.7	10.3	10.2	9.6	8.7	8.2	8.1	8.1	8.1	7.8	7.8	8.7
New York, N. Y.	14.6	14.3	13.8	13.9	13.2	13.6	13.8	14.6	15.3	16.1	16.5	16.3	16.6	15.9	15.9	15.2	15.4	14.9	15.0	14.6	14.3	13.8	14.1	15.0	14.1	14.9
Norfolk, Va.	7.2	7.5	8.2	8.1	7.6	8.0	8.5	8.2	8.2	9.2	9.9	10.6	10.6	10.5	10.1	9.8	9.5	8.2	8.0	7.7	7.8	7.6	7.5	7.6	7.1	8.5
Northfield, Vt.	7.7	8.3	7.3	6.9	6.6	6.0	6.3	6.8	6.8	6.8	8.3	9.9	9.5	9.1	8.6	8.5	8.6	7.9	8.0	7.7	6.4	6.4	5.9	6.2	7.0	7.4
North Platte, Nebr.	8.3	7.9	7.9	8.0	7.4	7.0	7.3	7.6	6.9	6.7	7.2	8.1	9.8	10.6	11.9	13.6	14.2	14.9	14.6	14.2	13.9	13.7	13.3	13.4	13.6	13.5
Oklahoma, Okla.	7.9	7.6	7.6	7.3	7.7	7.7	7.6	7.3	7.4	8.2	8.2	10.0	10.5	10.3	10.5	10.4	10.5	10.3	9.8	9.8	9.2	8.6	8.2	8.2	8.1	8.3
Omaha, Nebr.	7.1	7.4	7.6	7.1	7.6	7.7	7.3	7.1	7.4	7.4	8.1	7.9	8.4	8.5	8.4	8.5	8.5	8.5	7.9	7.3	7.1	7.6	6.9	6.9	7.1	7.1
Oswego, N. Y.	12.0	12.8	13.1	13.1	13.4	13.2	12.2	12.0	12.5	13.0	12.8	12.8	12.6	11.8	11.8	12.5	12.0	11.3	10.9	10.7	10.7	11.7	11.2	11.6	12.0	12.1
Palestine, Tex.	5.8	5.8	5.9	5.9	5.9	5.7	5.8	6.3	6.5	7.0	7.3	7.7	8.0	8.5	8.0	8.0	8.2	8.3	7.7	6.3	6.3	5.3	5.9	6.3	6.2	6.7
Parkersburg, W. Va.	5.1	4.8	4.9	4.5	4.2	3.9	4.2	4.3	4.4	5.1	5.6	6.0	5.9	6.4	5.8	6.4	5.9	5.8	5.3	4.1	4.3	4.3	4.4	3.9	3.9	4.8

* For 21½ days.

TABLE VII.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Pensacola, Fla.	8.6	9.0	8.5	8.7	8.6	8.5	8.7	8.5	8.6	9.4	10.8	10.5	10.0	10.0	10.6	10.6	10.0	9.1	8.6	8.9	8.7	9.1	8.7	9.3	9.2
Philadelphia, Pa.	9.9	9.9	10.3	10.2	10.1	9.7	10.1	10.6	11.8	12.5	12.9	13.2	12.9	12.8	12.5	12.2	11.6	10.2	9.6	10.0	10.1	9.7	9.6	9.5	10.9
Phœnix, Ariz.	4.2	4.6	4.7	4.9	4.4	4.5	4.5	4.4	4.6	4.5	4.5	5.0	5.2	5.3	5.1	5.2	4.4	4.2	3.2	3.1	2.8	2.8	3.3	3.4	4.3
Pierre, S. Dak.	7.6	7.7	7.8	8.6	7.7	7.2	7.3	7.3	7.2	6.7	7.4	7.7	9.1	9.4	10.7	10.3	10.2	9.7	8.9	8.5	8.4	8.7	8.0	7.6	8.3
Pittsburg, Pa.	6.4	6.2	6.2	6.2	6.0	6.3	6.2	6.2	6.5	7.2	7.7	7.7	7.9	7.6	7.9	7.8	7.6	6.9	6.9	6.6	6.6	6.8	6.6	6.3	6.9
Port Angeles, Wash.	5.7	5.1	5.6	5.8	5.3	5.3	5.0	5.6	5.8	5.8	6.4	6.2	6.1	6.7	7.1	7.2	6.7	6.6	5.8	5.8	5.8	5.5	5.4	5.1	5.9
Port Huron, Mich.	10.3	9.5	8.9	9.4	10.3	10.2	10.9	10.7	11.0	11.6	12.1	12.1	12.8	12.2	12.4	12.0	11.5	10.2	10.3	10.2	10.3	10.1	10.1	10.0	10.8
Portland, Me.	7.2	7.3	7.5	7.1	6.9	6.7	6.3	6.5	7.5	7.8	7.8	8.3	8.4	8.1	7.7	7.3	7.4	6.6	7.1	7.4	7.6	7.6	7.6	7.1	7.4
Portland, Oreg.	6.8	7.2	7.0	7.3	7.2	7.3	7.5	7.0	7.0	8.1	8.2	6.5	8.0	7.9	7.9	8.7	9.0	9.6	9.3	9.0	8.2	8.4	7.7	6.3	7.8
Pueblo, Colo.	6.2	5.3	5.5	5.4	5.3	5.5	5.7	5.5	5.0	6.2	6.2	6.3	7.9	9.2	9.3	8.9	8.7	8.5	8.1	7.2	6.1	5.5	5.9	5.9	6.6
Raleigh, N. C.	6.2	6.3	5.9	5.7	5.9	6.1	6.1	6.1	6.1	7.0	8.1	8.2	8.5	8.0	7.6	7.5	6.5	5.7	5.3	5.5	5.5	5.5	5.4	5.5	6.4
Rapid City, S. Dak.	7.8	7.0	7.5	8.1	8.2	7.8	8.1	8.7	8.7	8.0	9.0	8.2	10.0	11.1	11.9	12.1	11.7	10.1	8.4	7.9	7.9	7.6	8.5	7.6	8.8
Red Bluff, Cal.	9.0	8.9	8.7	8.4	8.8	9.1	9.3	9.0	9.1	9.1	9.2	8.4	8.7	9.0	9.7	9.4	9.5	9.6	8.6	8.9	8.8	7.8	8.7	9.2	9.0
Rochester, N. Y.	8.2	8.0	7.9	7.6	7.5	7.6	7.9	7.4	7.2	7.7	8.8	8.9	9.6	9.9	9.6	9.2	8.6	8.7	8.4	7.7	7.6	7.8	7.9	7.5	8.2
Roseburg, Oreg.	3.1	3.3	3.2	3.0	3.0	3.1	3.4	3.9	3.8	4.0	4.4	4.5	4.5	4.4	4.2	4.7	5.1	4.8	5.0	4.5	3.8	3.5	3.4	3.3	3.9
Sacramento, Cal.	9.6	10.4	10.1	10.3	10.7	10.4	9.8	10.2	10.8	11.0	10.9	11.6	11.4	11.5	11.8	11.6	11.4	11.5	10.4	10.0	9.3	10.0	10.0	9.6	10.6
St. Louis, Mo.	10.2	10.2	10.2	9.6	9.1	8.7	8.9	9.5	10.1	11.0	10.8	11.2	11.1	11.0	11.2	11.2	11.5	11.0	10.8	11.3	11.3	11.2	11.1	10.6	10.5
St. Paul, Minn.	7.2	7.4	6.8	7.4	7.2	7.0	6.8	7.2	7.5	7.6	8.1	8.5	8.7	9.1	9.2	8.7	8.5	8.3	7.7	7.6	7.4	7.1	7.7	7.6	7.8
St. Vincent, Minn.	9.3	9.5	9.9	10.0	9.6	9.5	9.2	9.2	9.2	9.1	9.4	10.5	11.1	10.9	11.2	10.9	10.2	9.5	8.8	8.3	8.5	8.6	8.5	8.8	9.6
Salt Lake City, Utah.	5.6	5.1	5.1	5.5	5.6	5.5	5.8	5.1	4.6	5.2	4.8	5.4	6.9	7.9	7.4	7.5	7.3	7.2	5.8	5.5	5.3	4.4	4.1	5.3	5.7
San Antonio, Tex.	6.9	6.6	6.3	6.4	6.7	6.9	7.2	7.0	7.4	7.6	8.6	9.3	9.6	9.6	9.3	9.5	9.3	9.1	8.3	7.9	7.8	7.9	6.8	6.8	7.9
San Diego, Cal.	3.0	2.4	2.8	2.5	2.9	3.5	2.8	2.9	2.5	2.5	3.2	2.7	2.8	3.8	5.1	6.6	6.9	6.7	6.5	6.0	3.7	2.8	2.5	2.8	3.8
Sandusky, Ohio.	9.0	8.5	7.9	8.0	7.7	7.5	7.6	7.7	8.0	8.1	8.6	9.2	9.2	9.4	9.8	9.5	9.2	8.5	8.5	8.3	7.8	8.3	8.5	8.8	8.5
San Francisco, Cal.	8.0	8.3	8.9	9.0	9.0	9.5	9.3	9.1	9.5	9.1	9.2	9.5	9.8	9.8	9.8	10.0	10.4	10.7	11.5	10.5	9.3	9.5	8.6	8.7	9.5
San Luis Obispo, Cal.	4.7	4.5	5.0	4.9	5.4	5.3	5.5	5.7	5.9	5.7	5.4	5.4	5.5	5.6	6.3	7.2	7.7	7.8	7.0	7.0	6.2	5.6	5.1	4.7	5.8
Santa Fe, N. Mex.	4.9	4.6	4.9	4.8	4.5	4.9	5.2	5.1	5.6	6.0	6.4	7.8	8.9	8.9	9.1	9.0	9.1	8.6	7.4	5.5	5.2	4.9	4.9	4.8	6.3
Sault Ste Marie, Mich.	8.8	8.7	7.9	7.6	7.7	7.9	7.9	7.8	7.6	8.0	8.6	8.4	8.8	9.5	9.5	9.5	8.9	8.3	8.1	8.6	8.8	8.4	8.3	8.2	8.4
Savannah, Ga.	6.1	6.1	6.2	6.6	6.8	6.6	7.3	6.8	6.4	7.5	8.5	8.6	9.2	8.9	8.7	9.1	8.6	7.9	6.9	6.8	7.2	6.6	6.4	6.2	7.3
Seattle, Wash.	6.8	6.4	6.6	6.8	7.2	6.3	6.9	7.1	7.5	7.0	6.6	7.0	7.8	7.5	7.5	7.9	8.2	8.5	7.5	7.5	7.4	6.8	6.5	6.6	7.2
Shreveport, La.	6.1	6.5	6.3	6.1	6.2	6.6	6.6	6.7	6.7	7.3	7.9	8.4	8.3	7.5	7.9	8.0	7.7	7.3	6.5	5.8	6.0	6.3	6.5	6.5	6.9
Sioux City, Iowa.	10.9	10.7	11.5	11.0	11.5	11.2	9.6	10.2	10.3	10.5	11.2	11.3	11.3	12.9	13.3	13.3	12.9	11.9	10.4	10.0	10.7	11.1	11.1	11.1	11.2
Spokane, Wash.	7.2	7.1	6.3	5.8	5.9	6.3	6.0	5.6	5.0	5.2	5.6	5.8	5.9	6.6	6.3	6.3	7.0	6.7	6.5	6.9	6.5	6.2	6.2	6.4	6.2
Springfield, Ill.	8.7	9.2	9.1	8.9	8.7	8.2	7.9	8.3	8.4	9.5	10.1	10.0	10.2	10.6	11.0	11.0	10.5	9.5	9.3	9.5	9.5	10.2	9.7	9.1	9.5
Springfield, Mo.	9.5	9.1	9.3	8.9	8.7	9.0	8.2	9.1	9.7	9.5	10.5	10.6	11.5	11.4	11.3	11.5	10.6	9.7	8.9	9.8	9.5	9.6	9.7	9.7	9.8
Tampa, Fla.	4.5	5.1	5.3	5.0	5.2	4.9	4.7	4.6	5.4	6.5	7.4	8.0	7.9	8.3	8.0	7.7	7.0	6.0	5.1	4.6	4.4	4.8	4.7	4.2	5.8
Tatoosh Island, Wash.	18.6	19.2	18.5	17.5	17.1	17.7	17.6	18.9	19.0	18.9	19.2	19.3	18.9	17.7	18.2	17.6	18.1	19.2	18.2	19.5	20.4	19.3	19.6	20.3	18.7
Toledo, Ohio.	9.8	9.8	9.1	8.8	8.7	8.3	8.7	9.1	9.2	9.9	10.3	10.6	10.5	11.0	11.1	10.8	10.5	10.0	9.8	9.7	9.9	10.0	10.3	9.7	9.8
Vicksburg, Miss.	7.7	7.2	7.0	6.7	6.6	7.2	7.6	7.6	7.4	7.2	7.2	6.8	7.1	6.8	7.2	7.3	8.1	7.6	7.1	7.7	7.4	7.3	7.2	7.4	7.3
Vineyard Haven, Mass	10.2	10.1	9.9	9.9	9.7	9.5	9.6	9.4	9.7	10.6	11.2	11.1	11.6	11.5	11.5	10.9	9.9	10.0	10.0	9.9	10.0	9.9	9.8	9.5	10.2
Walla Walla, Wash.	8.7	9.1	8.4	7.8	7.3	6.7	7.0	7.0	7.0	6.8	6.8	6.8	7.4	7.4	8.7	8.9	8.2	6.9	6.8	6.6	7.0	7.5	7.2	8.6	7.5
Washington, D. C.	7.1	7.0	6.6	6.0	6.0	6.7	6.2	6.0	6.5	8.3	9.7	9.5	9.9	9.5	9.4	8.5	8.1	7.5	6.6	6.6	6.1	6.3	6.5	7.0	7.4
Wichita, Kans.	6.7	7.2	7.0	7.6	6.9	7.2	7.6	8.0	8.3	9.0	10.0	9.9	10.5	10.8	11.1	11.4	9.6	8.8	7.6	7.3	6.9	7.0	6.7	6.7	8.3
Williston, N. Dak.	7.5	7.1	7.5	7.0	7.9	8.0	8.4	8.1	8.1	8.5	9.0	9.0	9.8	12.2	12.8	12.2	12.2	11.4	10.2	9.1	8.2	7.5	7.5	7.6	9.0
Wilmington, N. C.	6.7	6.9	6.8	6.7	6.6	7.0	7.1	7.2	7.3	8.0	8.5	8.8	9.4	10.2	10.5	10.3	8.7	7.5	7.0	6.6	6.7	6.5	6.5	6.5	7.7
Winnemucca, Nev.	11.0	11.9	11.1	11.3	11.4	11.5	10.9	11.0	11.4	11.7	11.7	12.3	13.9	14.8	14.7	14.8	15.3	13.7	13.4	12.1	11.0	10.6	10.0	10.4	12.2
Woods Hole, Mass.	18.2	17.9	18.1	18.3	18.7	17.3	17.2	17.0	17.1	17.5	17.5	16.8	17.0	16.3	16.5	15.7	15.0	14.5	15.3	15.8	15.9	16.4	16.5	16.3	16.8
Yuma, Ariz.	5.1	4.4	4.3	4.0	3.8	4.0	4.6	5.2	4.7	5.4	4.4	5.4	6.9	8.4	9.1	9.8	8.7	8.2	7.9	7.1	5.7	5.5	5.1	5.0	5.9

TABLE VIII.—*Heights of rivers above low-water mark, January*, 1896.

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Paul, Minn.[1]	2,057	14.0	.....	.....	.....	.....	.....	.....
La Crosse, Wis.[1]	1,867	10.0	.....	.....	.....	.....	.....	.....
Dubuque, Iowa[1]	1,759	15.0	.....	.....	.....	.....	.....	.....
Davenport, Iowa[1]	1,653	15.0	.....	.....	.....	.....	.....	.....
Keokuk, Iowa[2]	1,523	14.0	3.7	16	— 1.4	3	1.8	5.1
Hannibal, Mo.	1,402	17.0	0.8	16	— 1.1	5	0.0	1.9
St. Louis, Mo.	1,321	30.0	15.4	1	4.4	30,31	6.7	11.0
Memphis, Tenn.	910	33.0	17.9	3,4	3.3	27	9.5	14.6
Helena, Ark.	834	37.0	34.2	5	7.1	28	15.2	17.1
Arkansas City, Ark.	702	42.0	30.8	6	11.0	31	21.4	19.8
Greenville, Miss.	602	40.0	26.0	6	9.0	30,31	18.0	17.0
Vicksburg, Miss.	541	41.0	28.2	8	9.0	31	20.2	19.2
New Orleans, La.	108	13.0	9.0	12, 13, 15, 16	5.2	29-31	7.5	3.8
Missouri River.								
Pierre, S. Dak.[1]	1,122	13.0	.....	.....	.....	.....	.....	.....
Sioux City, Iowa[1]	802	18.7	.....	.....	.....	.....	.....	.....
Kansas City, Mo.[1]	386	21.0	.....	.....	.....	.....	.....	.....
Ohio River.								
Parkersburg, W. Va.[3]	786	38.0	15.6	28	5.1	21	9.2	10.5
Catlettsburg, Ky.	652	50.0	21.8	1	5.1	18	11.4	16.7
Cincinnati, Ohio.	500	45.0	24.2	2	7.5	22	14.1	16.7
Louisville, Ky.	368	24.0	9.9	3	4.6	28	6.9	5.3
Evansville, Ind.	184	30.0	19.4	4,5	5.3	24	11.4	14.1
Paducah, Ky.	47	40.0	17.3	4	5.3	23	10.2	12.0
Cairo, Ill.	1,140*	40.0	26.3	1	8.6	23	15.1	17.7
Monongahela River.								
Pittsburg, Pa.	966†	22.0	9.8	27	2.0	18,19	4.4	7.8
Great Kanawha River.								
Charleston, W. Va.	61	30.0	8.4	26	2.8	7,8	5.1	5.6
Big Sandy River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Louisa, Ky.	.....	.....	6.8	3	3.2	21	4.7	3.6
Wabash River.								
Mount Carmel, Ill.	50	15.0	10.5	30	3.2	23	5.1	7.3
Cumberland River.								
Burnside, Ky.	404	50.0	6.0	4	1.3	23	3.6	4.7
Nashville, Tenn.	145	40.0	15.4	1	3.2	23,24	6.0	12.2
Tennessee River.								
Knoxville, Tenn.	640	29.0	3.8	25	0.4	21	1.2	3.4
Chattanooga, Tenn.	455	33.0	8.2	26	2.3	17-21	4.1	5.9
Johnsonville, Tenn.	94	21.0	8.0	31	3.1	23	5.1	4.9
Arkansas River.								
Fort Smith, Ark.	351	22.0	16.9	1	5.3	30,21,30,31	7.2	11.6
Little Rock, Ark.	176	23.0	21.3	1	8.7	21-23	11.6	12.6
Red River.								
Shreveport, La.	449	29.2	11.2	6,7	6.8	30	9.2	4.4
James River.								
Lynchburg, Va.[4]	251	18.0	4.8	26	0.1	15,17,20	1.2	4.7
Congaree River.								
Columbia, S. C.	.....	.....	15.0	8.0	25	0.5	14,15	2.1	7.5
Savannah River.								
Augusta, Ga.	140	32.6	22.2	25	6.4	15	10.1	15.8
Alabama River.								
Montgomery, Ala.	215	48.0	21.7	24	2.2	16	7.3	19.5
Willamette River.								
Portland, Oreg.	.....	.....	15.0	14.1	24	4.3	16	8.6	9.8
Sacramento River.								
Red Bluff, Cal.	.....	.....	20.0	24.6	27	1.0	1-13	10.0	23.6
Sacramento, Cal.	.....	.....	28.0	26.6	29	9.4	1-13	16.4	17.2

*To mouth of Mississippi River. †To mouth of Ohio River. [1]River frozen. [2]Record for 19 days. [3]Record for 25 days. [4]Record for 27 days.

TABLE IX.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during January, 1896.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	39	4	10	22	n. 19 w.	37
Portland, Me	35	7	3	31	n. 45 w.	40
Northfield, Vt	29	27	1	9	n. 76 w.	8
Boston, Mass	31	8	7	26	n. 40 w.	30
Nantucket, Mass	34	8	28	6	n. 40 e.	34
Woods Hole, Mass.*	15	4	5	12	n. 32 w.	13
Block Island, R. I	35	4	22	22	n.	31
New Haven, Conn	43	4	4	23	n. 26 w.	43
Middle Atlantic States.						
Albany, N. Y	29	15	3	21	n. 52 w.	23
New York, N. Y	29	6	16	27	n. 26 w.	26
Harrisburg, Pa	13	10	20	25	n. 59 w.	6
Philadelphia, Pa	32	8	15	22	n. 16 w.	25
Baltimore, Md	22	12	14	24	n. 45 w.	14
Washington, D. C	30	14	14	21	n. 24 w.	18
Lynchburg, Va	19	18	17	26	n. 84 w.	9
Norfolk, Va	36	13	15	13	n. 5 e.	23
South Atlantic States.						
Charlotte, N. C	14	24	32	8	s. 67 e.	36
Hatteras, N. C	40	5	9	16	n. 11 w.	36
Kittyhawk, N. C	36	10	10	18	n. 17 w.	27
Raleigh, N. C	35	15	11	15	n. 11 w.	20
Wilmington, N. C	26	10	21	20	n. 3 e.	16
Charleston, S. C	27	12	21	16	n. 18 e.	16
Augusta, Ga	25	9	30	30	n.	16
Savannah, Ga	26	11	17	23	n. 23 w.	16
Jacksonville, Fla	26	13	23	17	n. 22 e.	16
Florida Peninsula.						
Jupiter, Fla	34	12	12	27	n. 47 w.	18
Key West, Fla	34	7	27	6	n. 39 e.	34
Tampa, Fla	29	8	18	29	n. 11 w.	21
Eastern Gulf States.						
Atlanta, Ga	19	9	24	25	n. 6 w.	10
Pensacola, Fla	33	12	17	15	n. 5 e.	21
Mobile, Ala	34	15	10	18	n. 23 w.	21
Montgomery, Ala	21	14	30	30	n.	7
Meridian, Miss	26	20	17	16	n. 9 e.	6
Vicksburg, Miss	15	22	28	12	s. 66 e.	18
New Orleans, La	25	17	20	16	n. 27 e.	9
Western Gulf States.						
Shreveport, La	21	21	22	13	e.	9
Fort Smith, Ark	16	8	30	15	n. 62 e.	17
Little Rock, Ark	23	15	15	18	n. 21 w.	8
Corpus Christi, Tex	27	15	26	10	n. 53 e.	20
Galveston, Tex	17	19	30	16	s. 63 e.	4
Palestine, Tex	26	17	22	13	n. 45 e.	13
San Antonio, Tex	33	13	21	10	n. 29 e.	23
Ohio Valley and Tennessee.						
Chattanooga, Tenn	18	13	21	19	n. 22 e.	5
Knoxville, Tenn	31	5	30	22	n. 4 w.	26
Memphis, Tenn	22	18	20	15	n. 51 e.	6
Nashville, Tenn	21	22	17	18	s. 45 w.	1
Lexington, Ky	11	23	21	21	s.	12
Louisville, Ky	19	20	18	18	s.	1
Indianapolis, Ind	15	22	20	19	s. 8 e.	7
Cincinnati, Ohio	12	20	24	21	s. 21 e.	8
Columbus, Ohio	14	23	19	22	s. 18 w.	10
Pittsburg, Pa	14	17	14	31	s. 80 w.	17
Parkersburg, W. Va	12	18	14	22	s. 53 w.	10
Lower Lake Region.						
Buffalo, N. Y	16	12	20	28	n. 63 w.	9
Oswego, N. Y	17	24	21	19	s. 16 e.	7
Rochester, N. Y	11	17	21	28	s. 49 w.	9
Erie, Pa	11	20	15	28	s. 55 w.	16
Cleveland, Ohio	12	23	21	23	s. 10 w.	11
Sandusky, Ohio	17	12	15	28	n. 69 w.	14
Toledo, Ohio	12	15	16	30	s. 78 w.	14
Detroit, Mich	14	20	11	29	s. 72 w.	19
Upper Lake Region.						
Alpena, Mich	15	17	14	27	s. 81 w.	13
Grand Haven, Mich	21	16	21	17	n. 39 e.	6
Marquette, Mich	22	16	10	32	n. 75 w.	23
Port Huron, Mich	11	23	14	26	s. 45 w.	17
Sault Ste. Marie, Mich	13	27	35	10	s. 59 e.	29
Chicago, Ill	16	23	13	21	s. 49 w.	11
Milwaukee, Wis	22	18	13	24	n. 70 w.	12

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Upper Lake Region—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Green Bay, Wis	19	26	4	20	s. 66 w.	18
Duluth, Minn	26	14	9	29	n. 59 w.	23
North Dakota.						
Moorhead, Minn	37	15	7	13	n. 15 w.	23
St. Vincent, Minn	33	18	8	11	n. 11 w.	15
Bismarck, N. Dak	29	5	24	18	n. 14 e.	25
Williston, N. Dak	24	19	15	14	n. 11 e.	5
Upper Mississippi Valley.						
St. Paul, Minn	20	17	20	22	n. 34 w.	4
La Crosse, Wis	19	25	7	21	s. 67 w.	15
Davenport, Iowa	18	13	22	21	n. 11 e.	5
Des Moines, Iowa	23	16	21	15	n. 41 e.	9
Keokuk, Iowa	23	17	20	17	n. 27 e.	8
Cairo, Ill	21	24	16	11	s. 50 e.	6
Springfield, Ill	16	24	18	18	s.	8
Hannibal, Mo	17	19	20	21	s. 37 w.	2
St. Louis, Mo	21	18	19	16	n. 45 e.	4
Missouri Valley.						
Columbia, Mo.*	8	7	13	12	n. 45 e.	1
Kansas City, Mo	19	26	19	12	s. 45 e.	10
Springfield, Mo	19	24	21	18	s. 31 e.	6
Omaha, Nebr	22	24	19	16	s. 56 e.	4
Sioux City, Iowa	10	13	8	9	s. 18 w.	3
Pierre, S. Dak	26	7	22	18	n. 24 e.	10
Huron, S. Dak	21	17	21	21	n.	4
Northern Slope.						
Havre, Mont	20	9	21	28	n. 32 w.	13
Miles City, Mont	24	16	18	17	n. 7 e.	8
Helena, Mont	16	22	1	39	s. 81 w.	38
Rapid City, S. Dak	15	19	11	29	s. 77 w.	18
Cheyenne, Wyo	22	11	2	40	n. 74 w.	40
Lander, Wyo	18	22	8	28	s. 79 w.	20
North Platte, Nebr	13	22	15	26	s. 51 w.	14
Middle Slope.						
Denver, Colo	17	29	8	19	s. 43 w.	16
Pueblo, Colo	23	9	16	28	n. 41 w.	18
Concordia, Kans	18	29	12	15	s. 15 w.	11
Dodge City, Kans	26	22	22	9	n. 73 e.	14
Wichita, Kans	22	26	13	13	s.	4
Oklahoma, Okla	25	27	15	9	s. 72 e.	6
Southern Slope.						
Abilene, Tex	21	27	11	13	s. 18 w.	6
Amarillo, Tex	22	27	8	14	s. 50 w.	8
Southern Plateau.						
El Paso, Tex	23	9	18	30	n. 41 w.	18
Santa Fe, N. Mex	27	15	34	8	n. 65 e.	29
Phœnix, Ariz	1	38	13	20	s. 11 w.	38
Yuma, Ariz	37	8	19	10	n. 17 e.	30
Independence, Cal	19	25	6	26	s. 73 w.	21
Middle Plateau.						
Carson City, Nev	16	26	15	15	n.	10
Winnemucca, Nev	12	20	24	16	s. 45 e.	11
Salt Lake City, Utah	7	30	23	16	s. 17 e.	24
Northern Plateau.						
Baker City, Oreg	11	37	15	10	s. 11 e.	26
Idaho Falls, Idaho	16	33	3	17	s. 39 w.	22
Spokane, Wash	17	26	16	13	s. 18 e.	10
Walla Walla, Wash	6	37	11	17	s. 11 w.	32
North Pacific Coast Region.						
Fort Canby, Wash	9	30	22	12	s. 25 e.	23
Port Angeles, Wash	3	39	9	19	s. 16 w.	37
Seattle, Wash	13	37	15	8	s. 16 e.	25
Tatoosh Island, Wash	5	28	27	16	s. 31 e.	21
Portland, Oreg	18	21	16	19	s. 45 w.	4
Roseburg, Oreg	7	27	23	19	s. 11 e.	20
Middle Pacific Coast Region.						
Eureka, Cal	9	31	24	16	s. 20 e.	23
Red Bluff, Cal	20	22	19	19	s.	2
Sacramento, Cal	13	33	16	15	s. 3 e.	20
San Francisco, Cal	20	23	10	21	s. 75 w.	11
South Pacific Coast Region.						
Fresno, Cal	14	6	34	18	n. 63 e.	18
Los Angeles, Cal	24	4	20	23	n. 9 w.	20
San Diego, Cal	26	9	17	27	n. 30 w.	20
San Luis Obispo, Cal	20	19	7	10	n. 15 w.	11

*From observations at 8 p. m. only.

TABLE X.—*Thunderstorms and auroras, January, 1896.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	50	T.																					2	11	5		1							19	4	T.
		A.																																0	0	A.
Arizona	42	T.																												5	1			6	2	T.
		A.																																0	0	A.
Arkansas	47	T.																				1	2	1								1	2	7	5	T.
		A.																																0	0	A.
California	302	T.																	4	1		1	4					10	2	4	4			30	8	T.
		A.																																0	0	A.
Colorado	82	T.																					1											1	1	T.
		A.																															1	1	1	A.
Connecticut	22	T.																																0	0	T.
		A.			8	1	2																											11	3	A.
Delaware	6	T.																																0	0	T.
		A.																																0	0	A.
Dist. of Columbia	4	T.																								1								1	1	T.
		A.																																0	0	A.
Florida	38	T.															1	6						6	16		4							33	5	T.
		A.																																0	0	A.
Georgia	38	T.																					1	3	11	1								16	4	T.
		A.																																0	0	A.
Idaho	34	T.																		3			1											4	2	T.
		A.																																0	0	A.
Illinois	97	T.																					1										1	2	2	T.
		A.			2																													2	1	A.
Indiana	46	T.																																0	0	T.
		A.																		1														1	1	A.
Indian Territory	8	T.																																0	0	T.
		A.																																0	0	A.
Iowa	96	T.																																0	0	T.
		A.			4	1					1																							6	3	A.
Kansas	82	T.														1																		1	1	T.
		A.									2	1	1		1														1					6	5	A.
Kentucky	39	T.																						1										1	1	T.
		A.				1																												1	1	A.
Louisiana	47	T.						1															9	7		2	1					4	4	28	7	T.
		A.																																0	0	A.
Maine	16	T.																																0	0	T.
		A.		1	8	5	4	1				2							2													1	24	8	A.
Maryland	42	T.																								2								2	1	T.
		A.								1																								1	1	A.
Massachusetts	81	T.																																0	0	T.
		A.			13		2											1												1				17	4	A.
Michigan	80	T.																																0	0	T.
		A.			1	1																	2					1						5	4	A.
Minnesota	70	T.																																0	0	T.
		A.		2	5	2					1				1					5	1	1										1	19	9	A.
Mississippi	47	T.																				1	5	4								1	4	15	5	T.
		A.																																0	0	A.
Missouri	96	T.																								1								1	1	T.
		A.	1	1				1																										3	3	A.
Montana	39	T.																																0	0	T.
		A.		1	1		1		2					1		1			1	1	1										2		12	10	A.
Nebraska	126	T.																																0	0	T.
		A.										1																	1					2	2	A.
Nevada	54	T.																		1			1											2	2	T.
		A.						1		1		1																	1				1	5	5	A.
New Hampshire	24	T.																																0	0	T.
		A.			7	2	5					1					1		2					1				1						20	8	A.
New Jersey	52	T.																																0	0	T.
		A.			2			1																										3	2	A.
New Mexico	34	T.																							1									1	1	T.
		A.																																0	0	A.
New York	90	T.																																0	0	T.
		A.			4	4	4		1	1	1							1	1						3	1							17	8	A.
North Carolina	52	T.																1	3															8	4	T.
		A.																																0	0	A.
North Dakota	36	T.																																0	0	T.
		A.		2	4	2	1	3	2	1	2			2					1	4													24	11	A.
Ohio	134	T.																																0	0	T.
		A.			1																					1		1			1		4	4	A.
Oklahoma	20	T.																																0	0	T.
		A.																																0	0	A.
Oregon	63	T.																				1	1											2	2	T.
		A.																																0	0	A.
Pennsylvania	100	T.																																0	0	T.
		A.																		1			1			1						1	4	4	A.
Rhode Island	8	T.																																0	0	T.
		A.			3																													3	1	A.
South Carolina	38	T.																					1	7	2									10	3	T.
		A.																																0	0	A.
South Dakota	46	T.																																0	0	T.
		A.			2						1			1							1								1					6	5	A.
Tennessee	47	T.																				1	1		2							1	7	12	5	T.
		A.																	1				1											2	2	A.
Texas	85	T.														1	1									4	3		1	3	10	13	9	44	11	T.
		A.																											1					1	1	A.
Utah	34	T.																					4	1										5	2	T.
		A.																																0	0	A.
Vermont	16	T.																																0	0	T.
		A.			1	1	1	1						1						1														6	6	A.
Virginia	37	T.																								3								3	1	T.
		A.			1																													1	1	A.
Washington	47	T.																																0	0	T.
		A.																																0	0	A.
West Virginia	38	T.																																0	0	T.
		A.																																0	0	A.
Wisconsin	58	T.																																0	0	T.
		A.		1	4	3	1	1				1			1					2		1											15	9	A.
Wyoming	13	T.																																0	0	T.
		A.																																0	0	A.
Sums	2,705	T.	0	0	0	0	0	0	1	0	0	0	0	0	0	2	2	7	7	5	0	5	33	35	45	17	9	10	3	12	15	19	27	254	....	T.
		A.	1	8	71	23	21	9	5	4	8	4	4	5	3	1	1	2	8	15	3	2	3	2	0	2	0	3	5	1	2	1	5	222	....	A.

TABLE XI.—*Hourly sunshine as deduced from sunshine recorders, January*, 1896.

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																Monthly summary.			
		A. M.								P. M.								Instrumental record.			Personal estimate.
		5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	
																		Hours.	*Hours.*		
Atlanta, Ga.	T.	.....	.....	30	29	32	51	57	65	61	59	51	43	39	30	.....	.....	152.6	316.2	48	44
Baltimore, Md.	T.	.....	.....	.....	33	25	39	47	48	49	52	45	39	34	30	.....	.....	122.7	303.8	40	37
Bismarck, N. Dak.	P.	.....	.....	.....	17	21	27	37	33	38	39	29	29	20	.....	.....	.....	84.3	279.8	30	35
Boston, Mass.	T.	.....	.....	.....	36	44	51	53	58	57	61	61	54	42	46	.....	.....	155.0	295.5	52	48
Buffalo, N. Y.	T.	.....	.....	.....	0	10	13	21	31	33	29	26	24	12	22	.....	.....	61.7	292.7	21	13
Chicago, Ill.	T.	.....	.....	.....	18	17	29	40	51	49	45	34	31	27	31	.....	.....	102.6	295.5	35	30
Cincinnati, Ohio	T.	.....	.....	.....	16	21	27	40	43	45	40	38	35	29	20	.....	.....	102.4	303.8	34	34
Cleveland, Ohio	P.	.....	.....	.....	4	5	18	26	25	31	33	30	20	4	15	.....	.....	59.8	295.5	20	33
Columbus, Ohio.	T.	.....	.....	.....	8	6	23	40	37	38	35	30	24	8	8	.....	.....	75.3	301.1	25	30
Denver, Colo.	P.	.....	.....	.....	72	78	80	83	88	86	80	79	79	70	46	.....	.....	219.9	301.1	80	57
Des Moines, Iowa.	T.	.....	.....	.....	29	37	45	55	54	55	58	55	51	46	15	.....	.....	145.3	295.5	49	38
Detroit, Mich.	T.	.....	.....	.....	22	25	37	43	50	43	36	33	27	20	23	.....	.....	101.1	295.5	34	27
Dodge City, Kans.	P.	.....	.....	.....	49	57	57	60	62	61	61	51	52	45	33	.....	.....	169.4	306.5	55	47
Eastport, Me.	P.	.....	.....	.....	39	40	53	59	61	54	62	59	53	51	100	.....	.....	154.2	286.3	54	43
Eureka, Cal.	P.	.....	.....	.....	16	19	23	25	28	32	29	29	28	16	24	.....	.....	74.7	298.4	25	26
Galveston, Tex.	P.	.....	.....	33	41	46	45	50	49	50	45	51	48	36	19	.....	.....	146.9	326.8	45	44
Helena, Mont.	P.	.....	.....	.....	21	20	35	45	45	51	54	48	38	37	.....	.....	.....	114.3	279.8	41	44
Kansas City, Mo.	P.	.....	.....	.....	31	28	42	36	34	37	41	38	30	30	10	.....	.....	102.1	303.7	34	37
Little Rock, Ark.	T.	.....	.....	.....	19	25	36	43	45	50	52	47	42	42	27	.....	.....	126.0	314.7	40	35
Louisville, Ky.	T.	.....	.....	.....	16	16	23	38	44	42	43	34	26	25	31	.....	.....	94.4	306.5	31	24
New Orleans, La.	T.	.....	.....	33	29	30	39	43	51	51	52	43	45	42	42	.....	.....	137.5	324.6	42	41
New York, N. Y.*	T.	.....	.....	.....	20	38	51	57	62	52	49	48	43	29	29	.....	.....	143.8	298.3	48	45
Philadelphia, Pa.	T.	.....	.....	.....	55	53	60	70	70	64	60	56	49	38	25	.....	.....	173.1	301.1	57	45
Phœnix, Ariz.	P.	.....	.....	78	81	82	87	87	78	75	80	81	68	60	54	.....	.....	245.2	318.3	77	72
Portland, Me.	T.	.....	.....	.....	11	44	61	74	83	81	84	70	52	29	38	.....	.....	179.2	289.7	62	45
Portland, Oreg.	T.	.....	.....	.....	21	19	18	24	37	37	39	29	16	17	45	.....	.....	74.0	283.1	26	31
Do.	P.	.....	.....	.....	21	19	17	21	32	28	28	21	16	17	45	.....	.....	63.0	283.1	22	31
Rochester, N. Y.	T.	.....	.....	.....	0	10	48	77	80	82	72	58	30	11	0	.....	.....	144.6	292.7	49	26
St. Louis, Mo.	T.	.....	.....	.....	38	39	47	52	57	56	56	54	49	35	33	.....	.....	147.3	303.8	48	41
Salt Lake City, Utah.	P.	.....	.....	.....	36	40	47	48	43	41	41	42	28	29	47	.....	.....	119.0	298.4	40	25
San Diego, Cal.	P.	.....	.....	0	42	54	62	68	66	72	75	74	72	46	28	.....	.....	197.7	318.5	62	56
San Francisco, Cal.	T.	.....	.....	.....	1	15	31	48	57	58	62	55	33	10	0	.....	.....	114.6	306.5	37	35
Santa Fe, N. Mex.	P.	.....	.....	.....	67	81	87	91	90	83	79	75	66	57	41	.....	.....	239.7	311.8	77	63
Savannah, Ga.	P.	.....	....	25	34	50	56	59	55	53	62	50	48	46	45	.....	.....	164.3	320.5	51	39
Vicksburg, Miss.	T.	.....	.....	25	24	32	25	34	35	43	45	43	40	30	23	.....	.....	107.5	320.5	34	32
Washington, D. C.	P.	.....	.....	.....	30	45	51	48	48	47	45	52	46	44	43	.....	.....	139.9	303.8	46	46
Wilmington, N. C.	T.	.....	.....	30	13	44	54	66	76	76	70	59	48	29	22	.....	.....	167.4	316.2	53	52

* Hourly values for 25 days only, remainder of data for 31 days.

TABLE XII.—*Excessive precipitation, by stations, for January, 1896.*

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Bermuda		2.92	22			
Collirene		3.55	22			
Goodwater		2.50	22			
Healing Springs		4.42	22			
Montgomery		2.62	21-22			
Pushmataha		2.50	21			
Selma		3.50	21-22			
Union Springs		2.70	22-23			
Uniontown		3.30	21			
Wetumpka		3.18	21-22			
Arkansas.						
Conway		2.90	30			
California.						
Bear Valley	25.30	9.50	16-18			
Do		4.10	20			
Berkeley	11.40					
Bowmans Dam	29.85	15.71	16-18			
Do		3.16	20			
Cloverdale	23.26	6.75	15-16			
Do		2.51	18			
Do		3.32	20			
Do		3.16	26			
Crescent City	11.24					
Davisville	10.79					
Edmanton	32.70	15.83	15-17			
Do		6.20	19-20			
Fordyce Dam	25.05	7.65	20-21			
Do		3.45	25			
Fort Bragg	10.02					
Fort Ross	34.04					
Georgetown	19.55	6.70	17-18			
Grass Valley	30.34	6.93	16-17			
Do		3.04	20			
Greenville	16.66	6.70	16-17			
Guinda	13.27	2.50	19-20			
Healdsburg	23.01	10.55	17-19			
Do		3.27	27			
Iowa Hill	17.77	5.80	17-18			
Kennedy Gold Mine	11.80					
La Porte	32.43	15.48	15-18			
Do		6.62	20-21			
Lodi		2.68	20			
Los Gatos	17.39	3.05	18			
Do		2.90	20			
Middletown	25.78	4.54	20			
Mills College	11.90	2.60	20			
Mount Glenwood	24.22	11.65	16-18			
Do		4.38	19-20			
Do		3.47	26-27			
Nevada City	19.61	6.49	16-17			
Do		2.65	20			
Oakland	11.03					
Orangevale	10.42					
Ormonde	25.53	8.50	16-17			
Do		3.58	20			
Oroville	11.41					
Palermo	10.03					
Pilot Creek	25.47	9.33	16-18			
Do		4.16	20			
Placerville	16.38	2.66	18			
Quincy	20.79	7.58	16-17			
Redding	14.52					
Rosewood	13.60					
Sacramento, V. O	10.46					
San Rafael	20.07	3.25	18			
Do		3.84	20			
Shasta	27.67	8.32	15-16			
Do		3.30	17-18			
Do		5.05	19-20			
Do		3.08	25			
Shasta Springs	13.35					
Summerdale	21.56	2.50	16			
Do		6.03	18			
Do		6.15	20-21			
Ukiah	16.68	2.83	20			
Do		2.77	26			
Upper Mattole	26.22	11.33	14-16			
Do		3.05	19			
Do		2.53	26			
Vacaville	14.46	4.26	19			
Walnut Creek	11.05					
Washington	24.12	11.61	16-18			
Do		2.69	20			
West Point	12.90	3.76	18			
Wire Bridge	11.40					
Yuba City	10.07					

TABLE XII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Florida.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Eustis		4.54	23			
Jupiter				1.56	1 00	25
Merritts Island		3.43	15			
New Smyrna		2.85	15			
Do		2.94	23			
Ocala		3.22	22-23			
Orange City		4.02	23			
St. Francis		3.05	21			
Georgia.						
Point Peter		2.60	16			
Savannah		2.53	15-16			
Illinois.						
Greenville		2.70	22			
Louisiana.						
Shreveport		4.12	30-31			
Trinity		3.30	22			
White Sulphur Springs		2.75	22			
Maryland.						
Green Spring Furnace		2.50	23-24			
Sharpsburg		2.51	23-24			
Mississippi.						
Austin		2.75	31			
Briers		3.70	21			
Fayette		5.86	21-22			
Mico		6.03	21-22			
Moss Point		2.60	15			
Natchez		2.50	21			
Pontotoc				1.35	1 00	31
Port Gibson		5.72	21-22			
Woodville		3.79	21			
Nevada.						
Lewers Ranch	10.70					
Verdi		2.62	17			
North Carolina.						
Lumberton		2.65	16-17			
Pantego		2.50	16-17			
Southport		3.23	16-17			
Oregon.						
Astoria	12.54					
Bandon	18.49	3.03	1			
Corvallis (near)	10.13					
Detroit	14.86					
Forest Grove	10.84					
Gardiner	16.58	3.30	15			
Glenora	27.12	7.12	7-8			
Langlois	22.10	2.60	16			
Lorella	10.23	2.50	21			
Merlin	11.08					
Nehalem	18.41					
Newport	11.09					
Salmon	14.02					
Toledo	14.68					
West Fork	14.80					
South Carolina.						
Georgetown		3.30	23			
Smiths Mills		2.51	22-23			
Tennessee.						
Tullahoma		4.10	31			
Waynesboro		3.00	31			
Texas.						
Angleton		2.50	6			
Brady		2.87	29-30			
College Station	10.93	7.13	29-30			
Hewitt		3.30	29-30			
Longview		2.76	29-30			
Luling		3.31	29-30			
Marshall	15.40					
Palestine		2.92	29-30			
Washington.						
Aberdeen	22.23	2.73	6			
East Clallam	26.93	3.85	4-5			
Do		2.95	6-7			
Do		2.73	25-26			
Fort Canby	11.53					
Lapush	21.46	2.72	26			
Madrone	10.80					
Monte Cristo	16.43					
Neahbay	25.85	6.79	3-5			
Do		2.57	25-26			
Olympia	10.86					
Port Crescent	10.10					
Pysht	17.96	3.40	4-5			
Do		3.00	6-7			
South Bend	17.44	3.10	8			
Tatoosh Island	22.57	3.54	4-5			
Union City	22.40	7.30	7-8			

TABLE XIII.—*Maximum rainfall in one hour or less, January, 1896.*

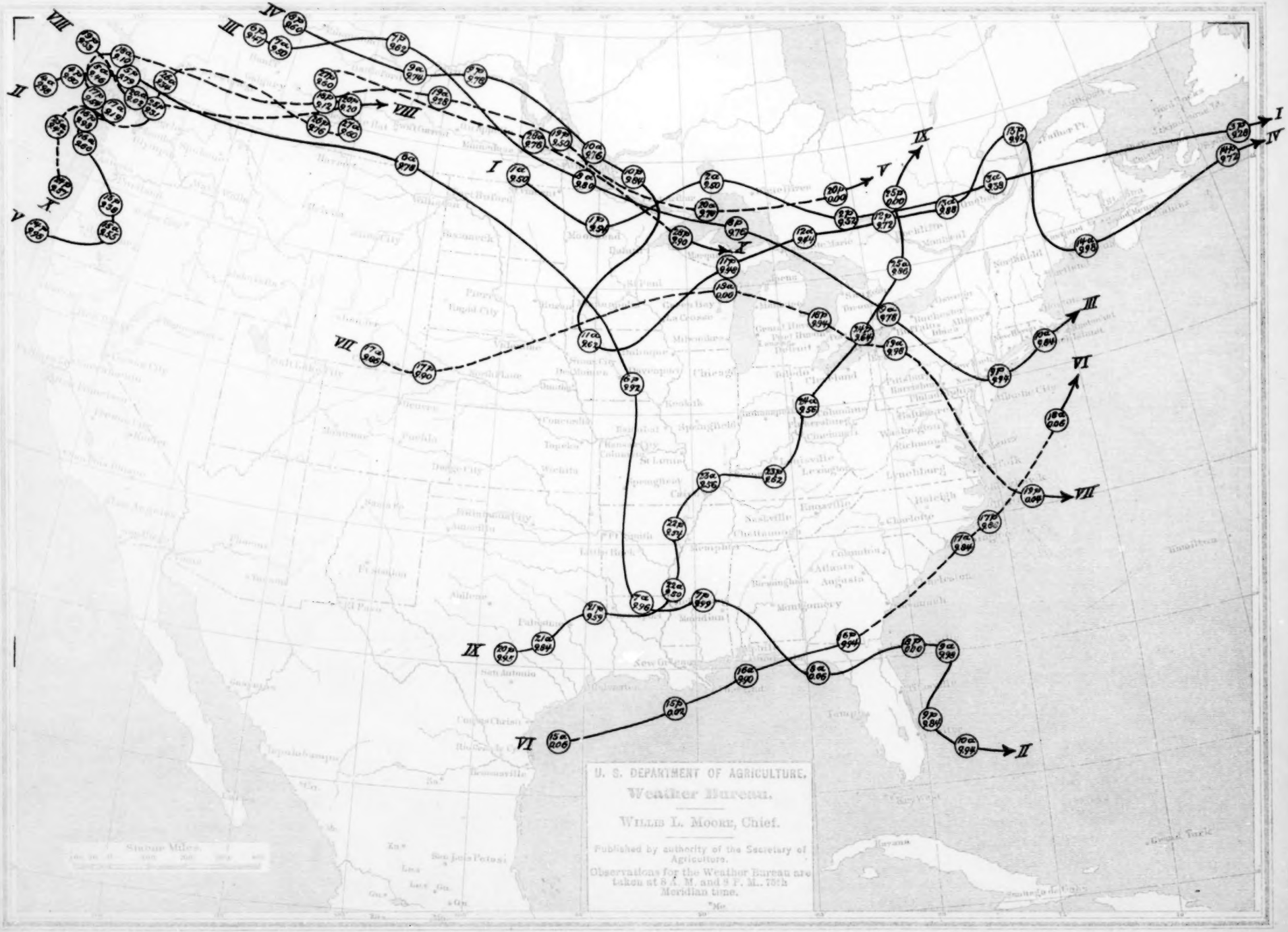
Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Atlanta, Ga.*						
Bismarck, N. Dak.*						
Boston, Mass.	0.04	24	0.06	24	0.25	24
Buffalo, N. Y.	0.03	24	0.05	24	0.24	24
Chicago, Ill.*						
Cincinnati, Ohio	0.01	23	0.02	23	0.06	23
Cleveland, Ohio*	0.01	18	0.02	18	0.06	18
Denver, Colo.†						
Detroit, Mich.*						
Dodge City, Kans.	0.05	29	0.05	29	0.09	29
Duluth, Minn.*			0.01	11	0.06	11
Eastport, Me.*						
Galveston, Tex.	0.09	7	0.11	7, 25	0.26	14
Indianapolis, Ind.			0.01	22	0.06	22
Jacksonville, Fla.	0.04	16	0.07	16	0.18	16
Jupiter, Fla.	0.45	26	0.75	26	1.56	26
Kansas City, Mo.*						
Key West, Fla.	0.09	9	0.12	9	0.37	9
Little Rock, Ark.	0.08	30	0.13	30	0.48	30
Louisville, Ky.*						
Memphis, Tenn.	0.06	31	0.10	2, 31	0.24	21

TABLE XIII.—*Maximum rainfall*—Continued.

Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Milwaukee, Wis.*						
Nantucket, Mass.*						
Nashville, Tenn.	0.03	2	0.05	2	0.19	2
New Orleans, La.	0.13	7	0.23	7	0.55	7
New York, N. Y.	0.02	24	0.04	24	0.08	24
Norfolk, Va.	0.03	17	0.06	17	0.23	17
Omaha, Nebr.*						
Philadelphia, Pa.*	0.05	24	0.07	24	0.24	24
Portland, Me.*						
Portland, Oreg.	0.04	17	0.05	17, 19	0.22	19
Rochester, N. Y.*						
St. Louis, Mo.	0.01	23	0.02	23	0.09	23
St. Paul, Minn.	0.02	19	0.03	19	0.07	19
Salt Lake City, Utah*	0.03	18	0.05	18	0.16	18
San Diego, Cal.	0.07	21	0.10	21	0.30	21
San Francisco, Cal.	0.15	17	0.25	17	0.58	17
Savannah, Ga.	0.13	23	0.19	23	0.43	16
Seattle, Wash.	0.02	5	0.04	5	0.14	5
Vicksburg, Miss.	0.12	31	0.16	31	0.52	31
Washington, D. C.	0.07	24	0.11	24	0.28	24
Wilmington, N. C.	0.11	22	0.18	23	0.40	17

*Record incomplete on account of snow and other causes. † Less than 0.05 in 1 hour.

Chart I. Tracks of Centers of Low Areas. January, 1896.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Weather Bureau.
WILLIS L. MOORE, Chief.
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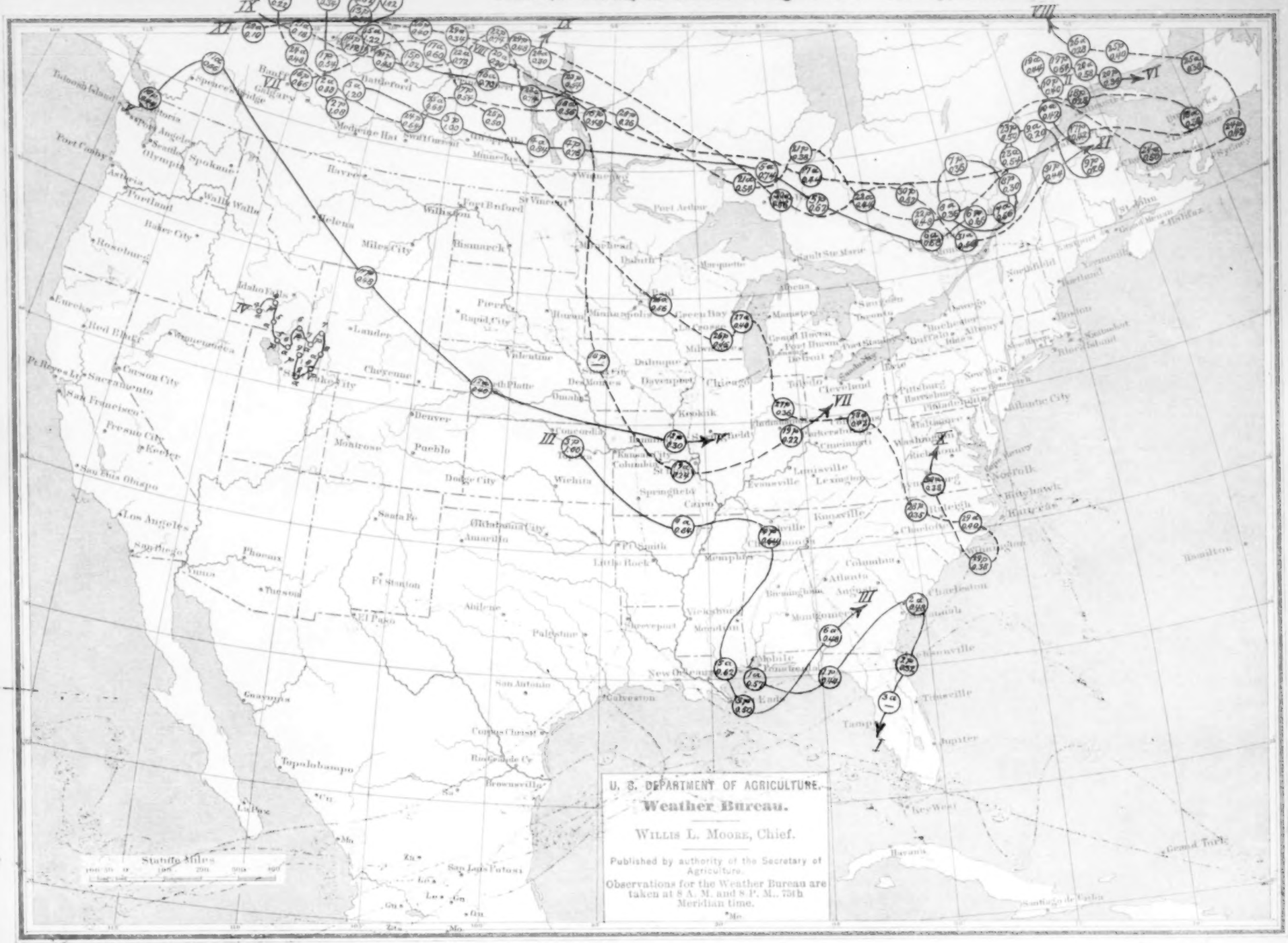
Observations for the Weather Bureau are taken at 8 A. M. and 8 P. M., 75th Meridian time.

Chart II. Tracks of Centers of High Areas. January, 1896.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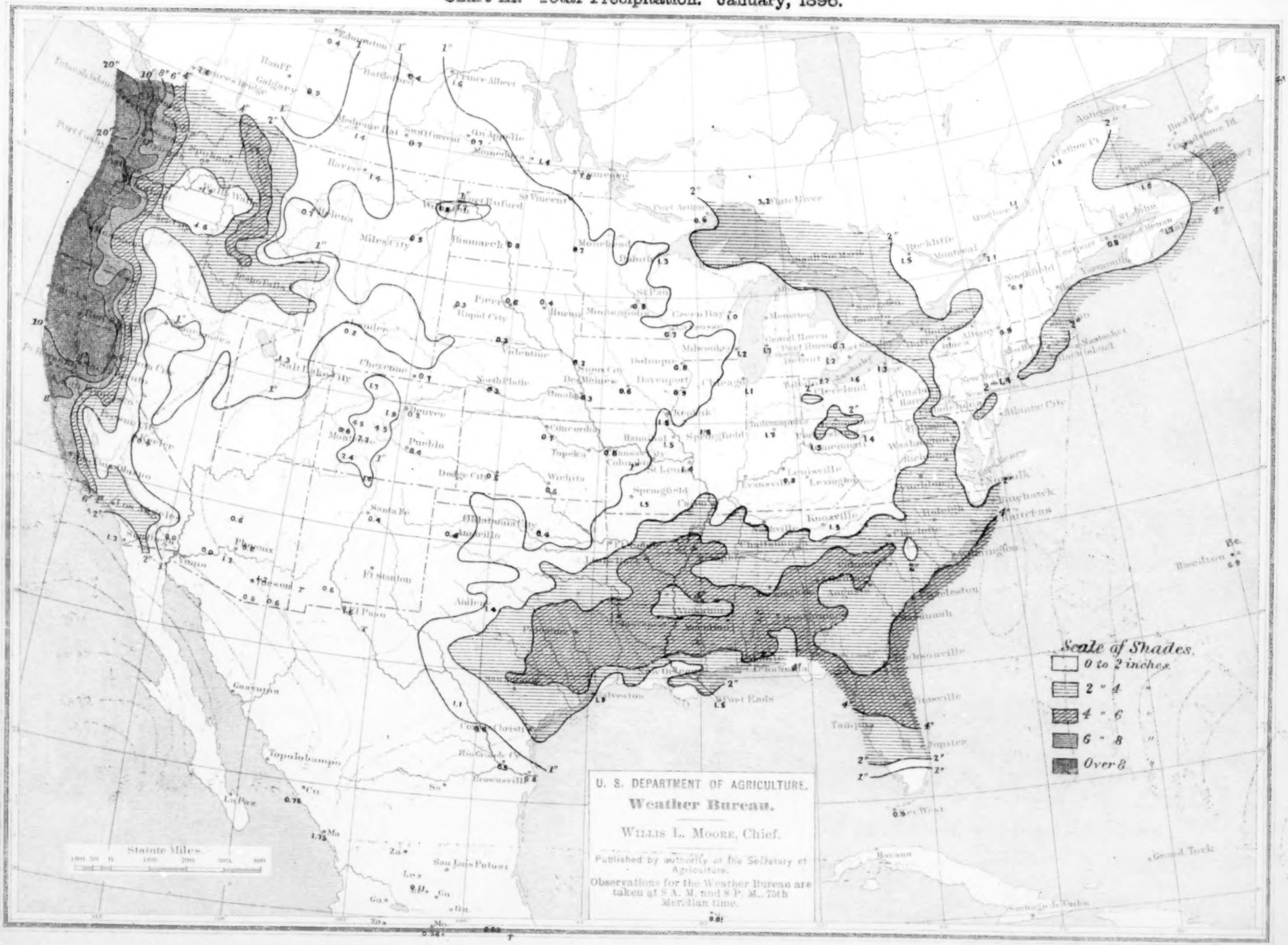
Statute Miles

Chart III. Total Precipitation. January, 1896.


Scale of Shades.
0 to 2 inches
2 " 4 "
4 " 6 "
6 " 8 "
Over 8 "
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Statute Miles.

Chart IV. Isobars, Isotherms, and Resultant Winds. January, 1896.

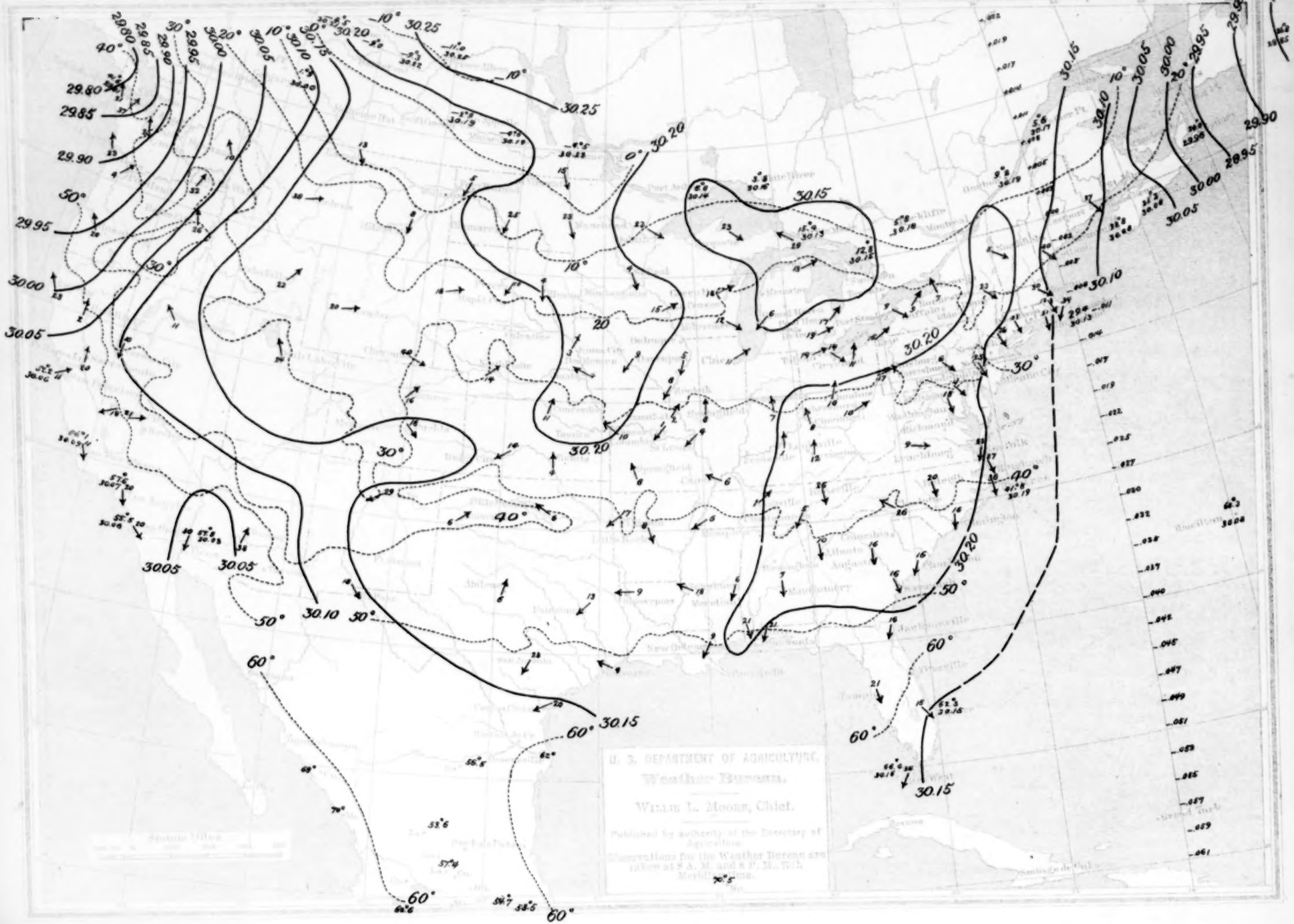
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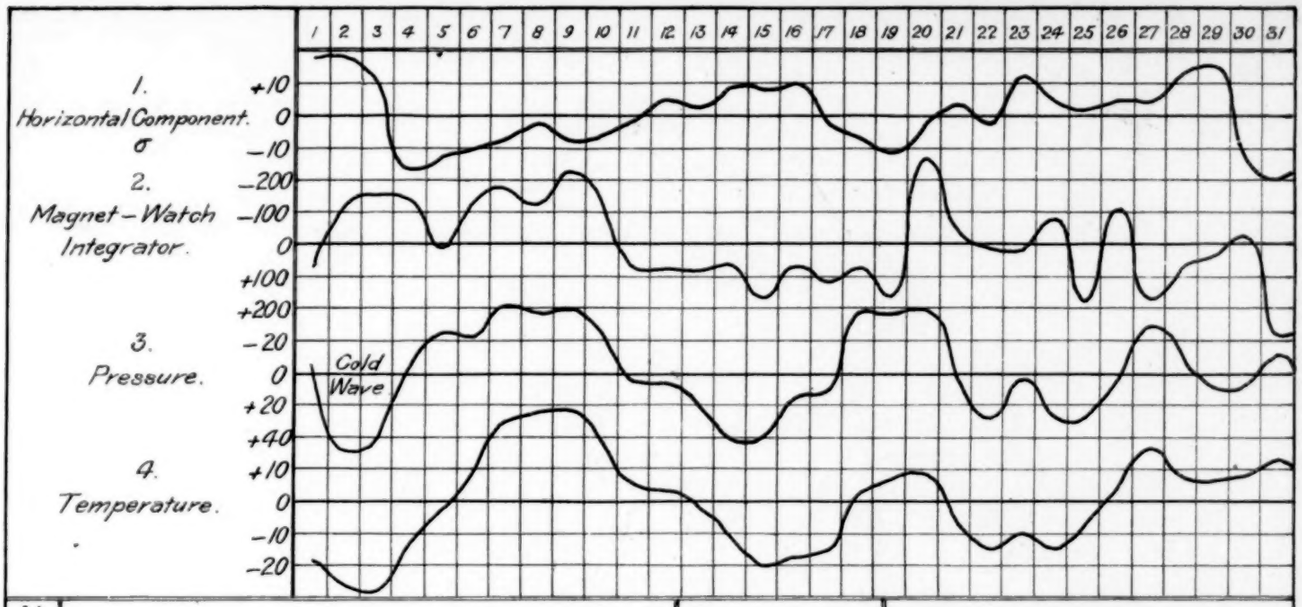
Chart V. Relative Variations of the Deflecting Magnetic Forces, the Northwest Pressures, and Temperatures. January, 1896.



January 1896.	Washington and Toronto. Deflecting Magnetic Forces.						Weather Bureau Magnet-Watch.		Northwest. Pressure.		Northwest. Temperature.	
	H	D	dx	dy	σ	β	Noon. h. m. s.	Δt	P	ΔP	T	ΔT
1	75	8.7	+19	−2	+19	354	11. 53. 9	+67	30.28	−4	−12	−18
2	75	8.9	+19	−1	+19	357	51.0	−129	30.80	+48	−21	−27
3	67	8.8	+11	−1	+11	355	48.23	−157	30.75	+43	−22	−28
4	39	9.5	−17	+2	−17	173	45.51	−152	30.28	−3	−7	−13
5	50	11.1	−6	+10	−12	121	45.55	+4	30.06	−25	1	−4
6	48	10.3	−8	+6	−10	142	43.42	−133	30.09	−21	14	+9
7	49	9.0	−7	−1	−7	188	40.46	−176	29.89	−41	30	+25
8	55	9.2	−2	−1	−2	204	38.52	−114	29.91	−38	32	+28
9	51	8.9	−6	−3	−7	206	35.15	−217	29.88	−40	33	+29
10	53	10.1	−4	+4	−6	135	33.12	−123	30.05	−23	22	+18
11	56	9.7	−1	+1	−1	135	34.43	+91	30.32	+5	8	+5
12	61	9.1	+4	−3	+5	324	36.13	+90	30.31	+5	7	+4
13	59	9.6	+2	−1	+2	334	37.46	+93	30.47	+21	1	−2
14	61	8.3	+4	−8	+9	297	38.56	+70	30.67	+42	−9	−11
15	63	8.9	+6	−5	+8	320	41.52	+176	30.65	+41	−18	−20
16	66	8.8	+8	−6	+10	322	43.9	+77	30.41	+17	−15	−17
17	58	9.5	0	−3	−3	270	44.58	+109	30.37	+14	−14	−16
18	55	9.0	−3	−6	−7	244	46.14	+76	29.85	−38	4	+2
19	51	11.9	−7	+9	−11	128	49.2	+168	29.85	−37	9	+7
20	54	10.1	−4	−1	−4	194	44.35	−267	29.83	−38	11	+9
21	61	10.6	+3	+2	+4	33	43.53	−42	30.21	0	−4	−6
22	57	9.8	−1	−3	−3	251	44.6	+13	30.47	+27	−13	−15
23	62	9.2	+4	−11	+12	290	44.33	+27	30.24	+4	−8	−10
24	65	10.1	+6	−2	+6	342	43.6	−87	30.47	+28	−14	−16
25	61	10.5	+2	+1	+2	27	46.17	+191	30.46	+28	−6	−8
26	61	9.5	+2	−4	+4	297	44.24	−113	30.19	+2	6	+3
27	60	9.5	+1	−4	+4	275	47.32	+188	29.85	−31	19	+16
28	71	9.1	+12	−5	+13	338	48.48	+76	30.04	−11	12	+8
29	74	9.2	+15	−4	+16	345	49.27	+39	30.23	+9	11	+7
30	47	9.8	−13	−1	−13	184	48.55	−32	30.20	+7	13	+8
31	41	11.2	−19	+7	−20	160	53.44	+289	29.98	−14	18	+13

Chart VI. Depth of Snowfall and Limits of Freezing Weather. January, 1896.

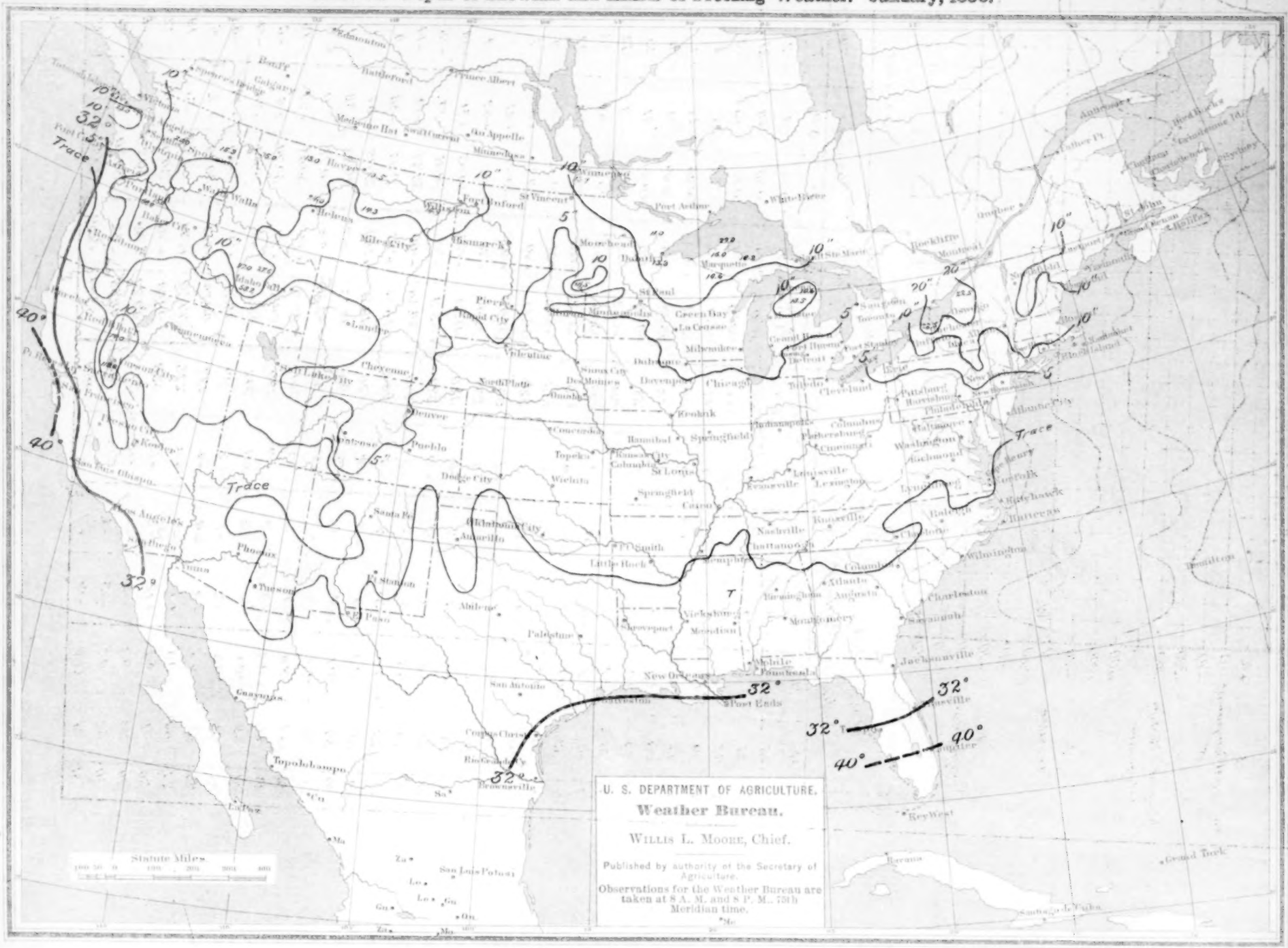
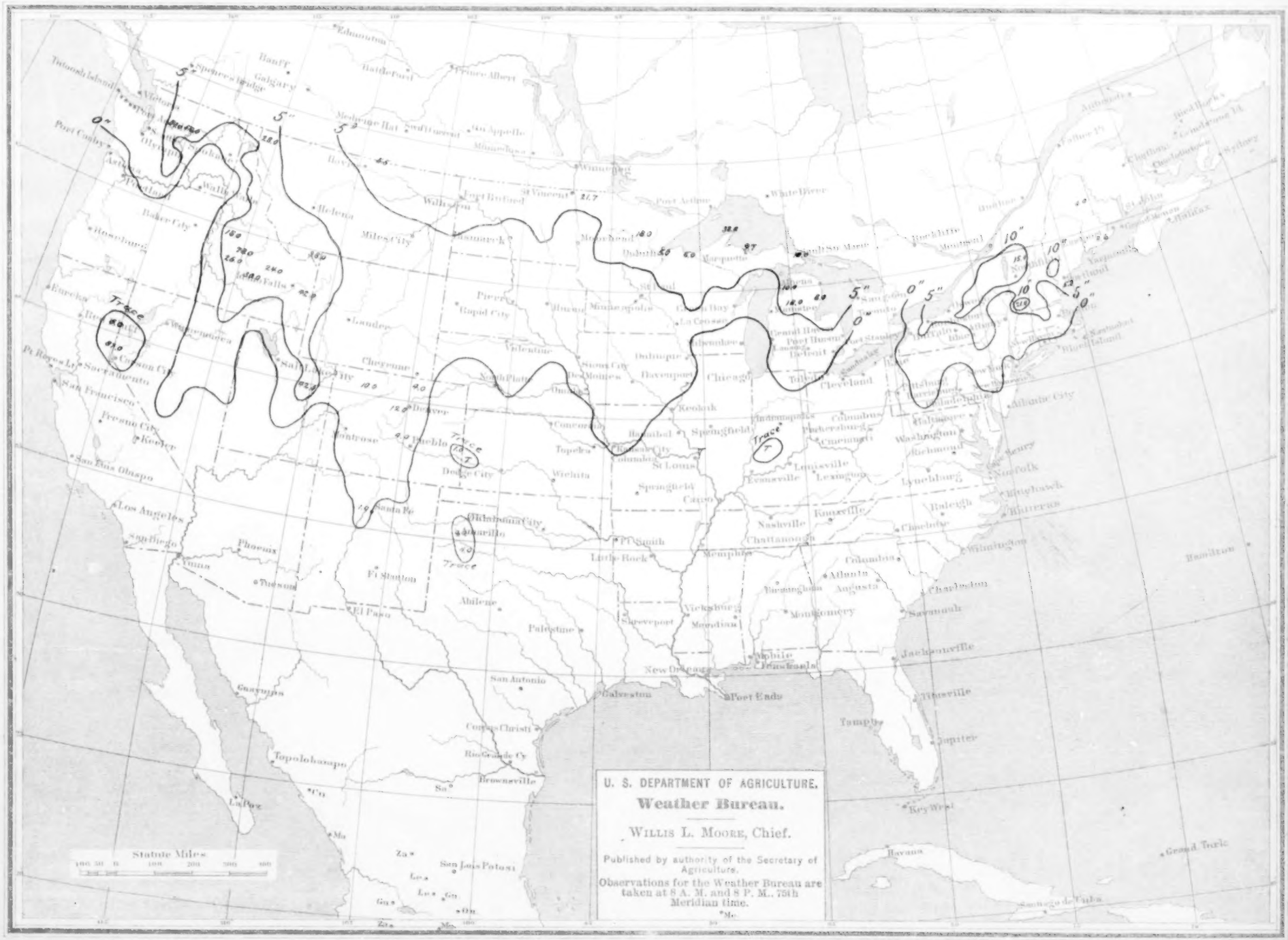


Chart VII. Depth of Snow Lying on Ground January 31, 1896.

Chart VII. Depth of Snow Lying on Ground January 31, 1896.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Statute Miles
Trace
0"
5"
10"